MYCOLOGIA

OFFICIAL ORGAN OF THE MYCOLOGICAL SOCIETY OF AMERICA

VOL. XXXVIII MAY–JUNE, 1946 NO. 3

E. W. D. HOLWAY

1853–1923

A BANKER'S AVOCATIONS

JOHN DEARNESS

Recently when studying some micro-fungi, which Professor Holway had reached by arduous climbing on a mountainside, skillfully mounted and photographed, the writer's thoughts were turned from the collection to the collector along the lines of the nature and value of a good avocation. The word does not need to be defined, but it may not be out of place to think in passing of its meaning. In modern civilized society people apportion their waking hours between work and leisure. In other words, work and play—vocation and avocation. Work is activity motivated by the expected result often called wages; play is activity motivated by the enjoyment of the action. It is natural and reasonable that a worker, knowing that continuous idleness is not conducive to either health or happiness, should dread compulsory retirement from his vocation. He can truly say, "Blessed is the man who can find satisfaction in the pursuit of a worth-while avocation." Such a man was the late Edward Willet Dorland Holway. His life was noteworthy in both vocation and avocation.

HIS YOUTH.—It might be said that he was a native of two of the United States, having been born in the county town of Lenawee in southeast Michigan, moved in infancy in the prairie covered wagon to the county of Winnieshiek in northeast Iowa and educated in its county town, Decorah. His aptitudes and progress at

[MYCOLOGIA for March–April (**38**: 115–230) was issued April 13, 1946]

school encouraged his parents to consider plans for his education that would lead to a professional life but his illness prevented the execution of them. In boyhood his health was frail; this was one reason why his mother took him on frequent outdoor trips to the fields and woodlands of the district. Another reason was to make him a sharer of her interest in nature.

Like many boys, he had a natural liking for making collections of different classes of objects, perhaps preferably of plants and flowers, which continued throughout his life; indeed in later years when he concentrated his attention on the parasites of plants, especially the Uredineae, the interest strengthened to a passion on which he spared neither labor nor expense. It is a measure of his success that the University of Minnesota is indebted to him for a gift of over 19,000 specimens.

MICROSCOPY.—The study he put upon the micro-fungi commonly known as plant-rusts, or technically, Uredineae, demanded a great deal of critical labor and a high degree of skill in two arts; namely, microscopy and photography. Either of them has been the satisfying life-avocation of some men.

Evidence of the superlative proficiency he acquired in these arts is found in a publication by the University of Minnesota Press entitled Holway's *North American Uredineae*. It appeared in five sections from 1905 to 1924, containing the history, description and distribution of 181 species with 54 plates, 11″ × 8″, each showing six lithographed photographs of spore groupings, most of them magnified five hundred times the natural size. It was of this work that Dr. J. C. Arthur wrote: "The perfection of Professor Holway's micro-photographic work is especially shown in the case of spores with thick dense walls and delicate, colorless pedicels." As an illustrated and dependable authority on nearly two hundred American plant-rusts, this treatise is likely to remain without a peer for a long time. It will always be the chief monument of Professor Holway's achievements in the science of botany.

MOUNTAINEERING.—A fourth avocation in which an honorable and permanent reputation, branched from his interest in plant hunting, was mountain exploring. How it originated is quoted by the late Howard Palmer from one of Holway's letters in *A pioneer of the Canadian Alps*. "The summer of 1901 was the

hottest ever known in Decorah. The thermometer stood at 106° F. I had not had my week's vacation, so I took the atlas to find the nearest place likely to be cool and selected Banff in the Canadian Rockies." Anticipating abundance of plant species in the British Columbia valleys, he started for Banff with hardly any other equipment than his purse and a plant press. Passing from Banff without delay to Lake Louise, he met and conversed with a mountain guide. The result of the meeting was that next morning, before sunrise, the guide with his rope and the would-be mountain climber with ice axe were on their way to climb Mt. Victoria. The sun rose in a clear sky but soon black clouds gathered; a thunderstorm became a snowstorm so dense that they could hardly see each other or where to step. They continued slowly, the snow changed to rain. Perseverance was rewarded. Before they saw Lake Louise again the guide had used the rope—Holway the ice axe, besides getting lessons in fording mountain streams and drying clothes in front of a wood fire. Mt. Victoria afforded enough climbing for the week and much experience to think about.

Not discouraged and better prepared, he was, on the first day of the next summer vacation, back at Lake Louise engaging the only guide there at the time. In this week he climbed both Mt. Hector and Mt. Temple, traversed Abbott Pass, sleeping two nights in the open air without a bed.

Mountaineering was now another hobby—the fourth. Dangerous risks became only challenges to his courage, strength and increasing skill. Limit of space bars the recital of some of his recorded experiences but gleaned phrases will suggest contexts: an avalanche of snow—on Mt. Geikie two rocks rolled down on my leg—food exhausted—after the cold night killed a porcupine, ate the liver and quarters without salt—a hardly visible crevasse—a grizzly bear and her two cubs—on Grizzly Creek our two pack horses fell off, one rescued, the other had to be shot—two people on Mt. Rainier without guide or ice axe, $1,000 reward, never seen or heard of since.

Some of the compensatory delights are suggested by phrases in his letters, such as—"most delightful trip—a glorious glacial trip—scenery unsurpassed—am sixty-one and I never felt better—an

appetite to be proud of—it is October now; I am just existing until next July." His physical fitness must have been well preserved when a mountaineering companion of his trips could say, "Holway is made of India rubber and steel springs."

For plant collecting, assisted by his wife, he enjoyed exploring the mountain valleys of Central and South America, but for the joy of mountaineering he always returned to the Canadian Rockies, particularly to the glaciated peaks of his "beloved Selkirks" in the Big Bend of the Columbia River. There he made the first known ascent of several peaks. His name as a first ascender is associated with the one commemorating the heroic nurse, Edith Cavell, who was judicially murdered by the Germans. Another mountain rising over ten thousand feet near the crossing of 118° west longitude and 51° 30′ north latitude, bears on map no. 237A of the Geological Survey of Canada the name of Mt. Holway. His name is also used for a stream discharging at last into the North Illecillewaet River. His annual papers, contributed from 1909 to 1918 to the Canadian Alpine Journal, vols. II–IX, made important extensions of the knowledge of the Big Bend region. He is credited with making forty-eight ascents of Albertan and British Columbian mountains, many of them without guides. "On the roll of pioneers in the Rockies and Selkirks, his name will ever hold an honored and distinguished place"—Howard Palmer.

VOCATIONAL LIFE.—As already stated, plans for a collegiate education of young Holway were frustrated. While yet within school age it happened that the manager of the only bank in Decorah offered him employment in the bank. His acceptance of the initial duties led him to adopt banking as his vocation. Step by step he climbed the ladder from messenger to manager.

The years passed. I can imagine him saying to himself in 1903 —"I am now fifty years old. For thirty-five years I have worked in the confining routine of this office. I have made a success of the bank and saved a competence upon which I can retire. My health is good yet. My happiest hours are those of my leisure in my garden, in fields and by streams, studying plants and flowers. This seems to be a good time to retire from the office and enter on a life free from care and rich in enjoyment." He announced his intended retirement to his surprised customers, who urged

him to reconsider his intention. Even with the admitted view of dollars on the horizon, he said to at least one friend that he "would rather be a living worker in the field of science than a dying millionaire."

In 1904 he had left Decorah and settled in Minneapolis near the University of Minnesota. His scientific library and important herbarium were donated to the University. There he had been given a room suitable for a laboratory with access to the facilities of the University for research and the rank of honorary Professor of Botany. The work there and in his new garden was real happiness. His time was at his own disposal; he was free to make those long collecting trips of which he had but dreamed.

HOME LIFE.—Having in mind the amount of outdoor work he accomplished in his spare time in Decorah, one might wonder whether he had any home life. His fellow citizens must have thought he had spare time as well as interest in the education of his two daughters when they elected him to serve on the Board of Education. Dr. J. C. Arthur, an intimate friend for many years, can be cited in these words: "On different occasions while Professor Holway lived in Decorah, it was my pleasure to have been a guest in his home where I had the privilege of meeting his family and his wife, née Effie Aiken, a woman of fine taste in many different lines, whom he married in 1876 and of whom he was bereft in 1917. The family had a splendid home life." On the 12th of December, 1918, he married Mary E. Mortenson. She was a graduate of the University of Minnesota, "a woman of splendid physique, rare ability and fine poise, an enthusiastic and intrepid companion." She accompanied him helpfully in his South American explorations and supervised the completion of the last volume of his *North American Uredineae*.

BIBLIOGRAPHICAL.—A complete bibliography of American fungi with whose names that of E. W. D. Holway is associated as discoverer or describer would fill pages. The following is a brief review:

In the *American Naturalist* **17**: 192–196, 1883, there is an article by J. B. Ellis, of Newfield, N. J., entitled *New species of North American fungi* in which E. W. D. Holway is credited with discovering eleven new species in the Decorah district from May to

October, 1882. One of the species is named *Hypoxylon Holwayi;* another was later raised to the rank of a genus and renamed *Holwaya* by Saccardo in Sylloge **VIII**, p. 646. Mrs. Mary M. Holway is honored in the name *Holwayella,* proposed by Dr. H. S. Jackson for a new genus of South American rusts. The name recognizes the importance of her work in the South American explorations.

Volume I of the *Journal of Mycology* appeared in 1885. The second article in this volume was *New fungi from Iowa* by J. B. Ellis and E. W. D. Holway. They are joint describers of fifteen new species all collected by Mr. Holway in the vicinity of Decorah, mostly in 1884. Not one of the twenty-six was a plant-rust. Every description included critical microscopical examination.

I have not found the date of, nor reason for, his specializing on the Uredineae. It was probably owing to Dr. Arthur's influence. *Puccinia areolata* was described by Dietel and Holway in 1894. Holway's series of *Notes on the Uredineae* in the *Journal of Mycology* was begun in 1902 and the first volume of his masterpiece, *The North American Uredineae,* was dated April 15, 1905; the others followed on May 15, 1906; May 10, 1907; June 11, 1913; and the fifth and last on July 2, 1924, fifteen months after his death.

Besides Paul Dietel, the most helpful of the Germans, other authors collaborating with him were: Paul and Hans Sydow, J. B. Ellis, Dr. J. C. Arthur, W. H. Long, and Dr. H. S. Jackson.

Arthur, J. C. The grass rusts of South America; based on the Holway collections. Proceedings of the Amer. Phil. Soc. **LXIV**, no. 2: 131–223, 1925. 10 photo-prints of spore groups. 74 species. Rust index and host index.

———. Uredinales of Costa Rica; based on collections made by E. W. D. Holway. Mycologia **10**, no. 3: 111–153. 1918. 118 species.

Jackson, H. S. The rusts of South America; based on the Holway collections I. Mycologia **18**, no. 4: 139–162. 1926. 1 plate. Species nos. 1–49.

———. *Ibid.* II. Mycologia **19**, no. 2: 51–65. 1927. Species nos. 50–82.

———. *Ibid.* III. Mycologia **23**, no. 2: 96–116. 1931. 4 figs., 1 plate. Species nos. 83–99.

———. *Ibid.* IV. Mycologia **23**, no. 5: 332–364. 1931. 6 figs. Species nos. 100–167.

———. *Ibid.* V. Mycologia **23**, no. 6: 463–503. 1931. Species nos. 168–250.

———. *Ibid.* VI. Mycologia **24**, no. 1: 62–186. 1932. Species nos. 251–468.

The descriptions of new species of fungi bearing the name "Holway" as discoverer or describer, totalling hundreds, were published in several scientific journals, mostly in English, some in German. Most of the descriptions dating prior to 1930 were reproduced in Latin in Saccardo's *Sylloge Fungorum.* A few early examples are cited here:

Holwaya gigantea (Peck) Durand, Coll. 1883, in Iowa.
Uromyces Holwayi Lagerheim, on *Lilium superbum,* 1889, Ann Arbor, Mich.
Puccinia Holwayi Dietel, on onion, 1893, in California.
Uraecium Holwayi Arthur, on hemlock, 1906 (1933), in Alaska.
Ravenelia Holwayi Dietel, 1894, in Texas.
Uropyxis Daleae Dietel & Holway, 1897, in Mexico.
Prospodium Holwayi Jackson, in Feb., 1922, in Brazil.

Citations from the *American Naturalist* **17**, 1883, and the American *Journal of Mycology* 1885 are made on a preceding page.

EXSICCATI.—The *North American Uredineae* and the numerous papers he published do not complete his legacy to science. Dr. J. Arthur Harris, the head of the Department of Botany in the University of Minnesota, believed that the large amount of duplicate material Holway had collected should be made as widely useful as possible. His widow, Mrs. Mary E. M. Holway, who had been the companion and assistant in Professor Holway's botanizing trips since 1918, was competent and willing to assort the material into labeled sets. It was found that there was enough of it to make up twenty-five sets of seven hundred specimens in each set called *Reliquiae Holwayanae.* Of these sets, two are now in Japan, five in Germany, one in Stockholm, one in the British Museum, twelve in America, besides the four yet in Mrs. Holway's possession. Every description involved critical microscopical examination.

EPICEDIUM.—With his objective still not completely achieved, March 1923 found Professor Holway in Phoenix, Arizona, planning trips in equatorial South America, particularly in the highlands of Ecuador. Fate was against him. On the last day of the month a valvular irregularity blocked forever the vital action of that tireless heart.

In his lifetime he was known to approve of the crematory disposition of lifeless bodies. His devoted wife made the long trip to the Asulkan Valley to lay his ashes in a favorite spot beneath the noble evergreens where, in the words of Howard Palmer, "solemn silences and cool sylvan shadows hold perpetual sway, while overhead the feathery fingers of the graceful branches point constantly to the snowy peaks he loved so well."

In his vocation as a banker his success will be honorably remembered for a lifetime. In his avocations his name and his fame as a Uredinologist will endure as long as the literature of botanical Mycology. Good maps of the Canadian Rocky Mountain region will always show the location of Mt. Holway.

ACKNOWLEDGMENTS.—My personal contacts with Professor Holway were limited to correspondence about plant rusts and reception of specimens from some of his valuable collections. For the portrait used as a frontispiece, for letters and consultations, I am indebted to my friend, Mrs. Ruth Holway Higgins, his younger daughter and onetime Secretary of an Ontario Authors' Association; for some unpublished information to his widow, Mrs. Mary E. M. Holway, whose work in the production of Part V of the *North American Uredineae* is beyond praise.

USE WAS MADE OF THE FOLLOWING PUBLICATIONS

Edward W. D. Holway, a pioneer of the Canadian Alps, by the late Howard Palmer, F.R.G.S., President, American Alpine Club, a onetime mountaineering companion.

Introduction of fourteen pages to *Grass rusts of South America* by Dr. J. C. Arthur, long an intimate friend who was able to say, "Whatever Holway undertook he always did unusually well." In the Introduction to *Reliquiae Holwayanae* the late Dr. Arthur Harris, Head of the Department of Botany of the University of

Minnesota, said of Holway, "Widely known for the critical nature of his collecting and the skill shown in his microphotographic illustrations."

Prominent men I have met, E. W. D. Holway, by L. H. Pammel, B.Agr., D.Sc., of Iowa State College, "It is probably correct to say he discovered more new plant rusts than any other botanist."

PROPOSALS CONCERNING THE NOMENCLATURE OF THE GILL FUNGI INCLUDING A LIST OF PROPOSED LECTOTYPES AND GENERA CONSERVANDA

ROLF SINGER AND ALEXANDER H. SMITH

Nomenclature is the handmaiden of taxonomy, not the mistress.
R. Ramsbottom, Trans. Brit. Myc. Soc. **25** (4): 439. 1942.

The taxonomist frequently finds himself burdened with difficult or insoluble problems of nomenclature which occupy time that he could more profitably devote to a study of the organisms themselves. Even though he arrives at the correct solution of a nomenclatorial problem, the result may be unfortunate, for it often happens that after a prolonged historical study and search for the valid name of a species, the one arrived at is not recognized by any mycologist. For instance, if the International Rules are followed, *Cortinellus flavovirens* is the valid name for the fungus we commonly call *Tricholoma equestre*. As an isolated instance this situation is unimportant. If, however, after careful study it is found that the number of changes which obviously work against the fundamental precept of the rules, i.e. the stabilization of commonly used names, is great, then it is logical to assume that something must be wrong with the rules as they are—at least as they apply to the gill fungi.[1] In our estimation this is unquestionably true at present.

The nomenclature of this group is unstable and confused for several reasons. In our estimation the four most important are:

(1) Strict application of the International Rules of Nomenclature is impossible as long as the names of the older genera such as those established by Quélet and Karsten remain applicable to more than one emended genus because of the lack of an officially chosen

[1] The term *gill fungi* as used here applies to the lamellate species of the Agaricales and is not intended to designate a taxonomic unit.

and accepted type species (*species lectotypica*, or *lectotype* as we shall designate it in the following discussion) for each of them (cf. Art. 51 and Art. 21, note 2, of the International Rules of Botanical Nomenclature). Because of the lack of lectotypes many generic names, as for example *Lepista*, have been used for different generic groups to the confusion of all who study the literature.

(2) Strict application of the rules would change the names of several well established and important genera such as *Clitocybe* and *Cortinarius* with scores or even hundreds of common and important species. The chief source of this difficulty is that S. F. Gray's *Natural arrangement of British plants*, 1821, is now known to be a post-Friesian publication (cf. Art. 20, f).

(3) The conservation of genera does not always find unanimous approval because of the existence of several schools of thought. For instance, there is a conservative school which follows Bresadola and is chiefly represented in Germany, England, and Italy; a second school advocating smaller and more homogeneous genera according to the principles of Fayod and Patouillard; and finally a third group still following the old American Code. The conservation of a name may be advantageous (from the standpoint of mutual understanding and continuity) for one school though disadvantageous from the point of view of one of the others (see *Marasmius* and *Rhodophyllus*). The overruling of the legitimate needs of any of these groups by a small and accidental majority of an International Congress appears to us to be both unfair and unwise, and certainly does not increase the moral authority of the International Rules. And let us not forget that moral authority is the only compelling factor involved after the rules have been made.

(4) Definite confusion exists concerning the use of the Friesian subgenera and tribes as genera. There is a tendency to consider these equivalent with the genera of Quélet and Saccardo [2] and there is also something like a common usage in Europe which neglects to indicate the name of the author who first transferred a species from *Agaricus* to one of the generic names raised from the

[2] See Bisby, Who is the author? Trans. Brit. Myc. Soc. **25**: 434–435. 1942. Also Dodge, C. W. Proposals of amendments of Article 20 of the International Rules of Nomenclature. Ann. Mo. Bot. Gard. **21**: 709–712. 1934.

original Friesian subgenera or tribes. Also, doubts have arisen as to the necessity of limiting ourselves in the choice of a lectotype to the species enumerated by the author who first treated a particular Friesian subgenus or tribus as a genus.

As already pointed out, by far the most important shortcoming is that named under (1). In fact, the absence of lectotypes in most older genera makes it impossible at times for the seriously minded and conscientious taxonomist to proceed with his studies in an orderly manner. Furthermore, the difficulties mentioned under headings (2) and (3) are very closely related to the lack of a complete list of lectotypes.

As for generic names, we believe that a reasonable weighing of the arguments for and against conserving certain names and an intelligent selection of lectotypes will establish a system of generic types which will form an acceptable basis for taxonomic work by representatives of all schools who accept the framework of the International Rules. It is not necessary, for instance, to outlaw all of Gray's genera. Some merely involve the use of an already accepted name and the only change necessary is that of the authority. Genera likely to lead to undesirable changes can either be reduced to synonymy by the proper selection of a lectotype or rejected in favor of certain nomina conservanda. We do not need to suppress the tendencies of one taxonomic school in favor of the other, for there are always more favorable ways if both points of view are considered.

Undoubtedly the most impartial way of finding out which solution of two or several possibilities is more practical for all of us is the arithmetical approach applied with some judgment and after consideration of all factors involved. If, for instance, a part of the French school of taxonomists (Romagnesi) prefers the genus *Drosophila* to what Kühner and A. H. Smith call *Psathyrella* emend. then we must ascertain quantitatively which solution—*Drosophila* or *Psathyrella*—has fewer ill consequences. The most outstanding ill consequence of a nomenclatorial change is the necessity of a high number of transfers. The number can easily be established at least approximately. Of course, it may be necessary to make some allowance for the relative importance of the species concerned. In our example, if *Drosophila* should be considered as

a candidate for the list of *nomina proposita conservanda* against the legitimate name *Psathyrella*, many more new combinations would have to be made than would be necessary by simply accepting the latter genus in the emended concept. We prefer this latter alternative. It does not take anything away from the very sensible solution proposed by Quélet at a time when the affinity of these elements with each other was extremely hard to recognize. Those who work in this group will appreciate Quélet's contribution under all (nomenclatorial) circumstances; those who do not will be unable to appreciate the value of his contribution regardless of whether *Drosophila* Quél. or *Psathyrella* (Fr.) Quél. becomes the accepted name.

As for the difficulties enumerated under (4), one must study the pertinent facts and consider the consequences of each proposal before forming an opinion. What would happen if Fries' subgeneric and tribal names were considered as genera? To ascertain the results of such a proposal the first thing to decide is which of Fries' publications shall be used as the legal basis or starting point, for he made many nomenclatorial changes during his life, and thus the names which shall be raised legally to the status of genera must be taken from a single publication. If *Systema Mycologicum* vol. 1 is selected as the starting point, as has been done already, it will no doubt surprise some to find that certain of the newly decreed generic names are entirely different from those we know from Saccardo and which for some reason have generally received preference. As an example *Galorrheus* would take the place of *Lactarius*. This shows how carefully one should study the literature and how much depends on a real working experience in a given group if sensible proposals are to be expected. In a later work of Fries the discrepancy between our present nomenclature and his would be less embarrassing, but then the whole problem, including the system of citing the authority, would not become simpler but more complicated, and basic changes would need to be made in the present International Rules. It appears to us that now it is more desirable to establish an orderly system of selecting generic names within the framework of the present rules than to try to revamp them completely and thus risk even worse confusion than that existing at present.

A strict application of the existing rules requires that an author-citation for a species should be made up of the original author of the species and the name of the investigator (or compiler) who transferred it to the presently accepted genus. Although we do not feel that Fries or any other investigator should be made an exception to this rule, we do believe that mycologists primarily engaged in non-monographic studies such as local floras need not feel obligated to be consistent with the present letter of the International Rules when monographs of the genera in question are lacking. In other words, we would be tolerant of citations such as *Mycena pura* (Pers.) Fr. instead of *Mycena pura* (Pers. ex Fr.) Quél. In fact it may be well to recommend this way of citation as the next best in order to discourage worse habits, but they should be limited for certain purposes and on a temporary basis.[3]

As for the question of whether or not it is proper to choose a lectotype from a work other than the one in which the Friesian tribe or subgenus is first cited as a genus, we may say that this depends on the definition the respective author gave of his genus. In the case of Quélet who is actually the most important author to be considered in this connection, we want to direct the attention of mycologists to a footnote in "Les Champignons du Jura et des Vosges," p. 60 of the first edition. The footnote reads: ". . . La classification et la synonymie sont celles de Fries, Summa Vegetabilium Scandinaviae et Monographia Hymenomycetum Sueciae. J'ai cru nécessaire d'élever au rang de genres, les sous-genres de Fries. . . ." This statement makes it absolutely clear that we are entirely within our rights if we choose a lectotype from either of the following two works: Fries, E. M. *Summa Vegetabilium Scandinaviae,* 1846–49; or Fries, E. M. *Monographia Hymenomycetum Sueciae,* 1857–63. We have made this one of the principles of our proposed list of lectotypes for all genera which were not unmistakably provided with a type species by their authors.

Other self-imposed rules which we thought to be helpful in order to achieve a solution least harmful to the stability of accepted generic concepts are the following:

[3] See also R. Heim, Fungi Iberici, Treb. del Museu de Ciències Naturals de Barcelona **15** (3): 16. 1934.

(1) The lectotype must, of course, comply with the requirements of the type method by being one of the species *originally* included in the genus or the group on which the genus was based.

(2) The lectotype should be selected in a way that avoids both substitution of little known names for well established genera [4] and the unreasonable increase of the list of genera conservanda.[5] This cannot be achieved if the so-called first-species-rule is followed. Many authors act as though they were under the impression that there is a rule or recommendation saying that the first species of a genus determines the type of a genus. This is not true for the International Rules of Botanical Nomenclature. On the contrary, the recommendations of the text of 1935 (Recommendation VI, p. 4) emphasize, especially for the fungi, the necessity of passing the first species by in order to fix the generic names as they are now commonly applied.

(3) The lectotype shall be selected from the species *not* belonging in any outstanding group which has been or may in the future be separated from the bulk of the genus unless the following paragraph applies:

The lectotype shall be selected from a group of species that has been claimed to be a separate genus rather than from a group of species that represents another older or generally accepted genus only when the genus into which the thus selected type species belongs would otherwise remain without a generic name, and provided that the maintaining of the particular generic name in question in an emended sense appears desirable. For instance, it has generally been considered to be desirable to save the Friesian names *Psilocybe* and *Armillaria*. This can only be done by accepting as type species of these genera *Psilocybe semilanceata* and *Armillaria luteovirens* because otherwise they would become synonyms of *Psathyrella* in the case of *Psilocybe* and *Tricholoma* in the case of *Armillaria* and the group around *Psilocybe semilanceata* as well as the genus into which *Armillaria luteovirens* belongs would have to be given new generic names.

(4) The lectotype should be selected from several otherwise suitable species by giving preference to the one which is best known

[4] According to the International Rules, Recommendation VI.

[5] According to the International Rules, Recommendation VI, footnote (1).

or the one which has been studied from all aspects and thus offers a clear picture of the affinities of the type species (and consequently the genus also) in case the definition of the genus should have to be changed.

(5) The lectotype should be selected (unless other factors make this impossible) according to the historical development of the generic concept in every particular case. In *Naucoria*, for instance, the genera *Tubaria, Agrocybe, Pholiotina, Phaeomarasmius, Alnicola* and *Phaeocollybia* (or elements of these genera) have, in this order, been split from *Naucoria*. It is therefore obvious that none of the authors who thus emended the genus *Naucoria* by gradually restricting it to a homogeneous group, considered the part they removed as containing the species "permanently associated" with that name. If these authors have actually emended the old concept of the genus, and if the groups they segregated have been accepted by some independent mycologists, we should not select a lectotype for *Naucoria* that deliberately eliminates one of these segregated genera. The lectotype should be selected from the generic group not yet designated as a separate genus under a new name. However, if, in contradiction to the Rules, the genus has been entirely split up and the original generic name discarded, one of the segregated groups (preferably one of those established by the author who discarded the original name) should be re-established under the original generic name for the whole group. In the case of *Naucoria* this is the group containing *N. centunculus, N. carpophila, N. effugiens*, etc. The same principle leads to *Hypholoma Candolleanum* as the type species of *Hypholoma* rather than to a species of the *fasciculare*-group, since Karsten first emended the genus *Hypholoma* by removing the latter group, making it the nucleus of his new genus *Naematoloma*.

(6) If, after elimination of such species as are not fit to be proposed as lectotypes according to the above principles, several species remain to be selected from, we gave preference to those most typical (i.e., most closely corresponding to the original diagnosis of the genus or the group on which the genus is based) of the genus and around which mycological tradition has been built, as for example, *Tricholoma equestre*. We give this principle a secondary place in view of Article 18, note, providing that the

above requirements are not necessary conditions under which a species can be chosen as lectotype under the type method. Nevertheless, it may be assumed that species conforming with the above requirements are less likely to be considered atypical in future taxonomic treatments than others, and therefore, our principle (6) will contribute to the aim outlined under (3).

(7) Preference is also given to such species as have been previously suggested though not officially accepted as species lectotypicae by other authors (Earle, Murrill, Clements & Shear, Maire, Wakefield and others) or by the senior author in a previous paper, in order not to destroy anything that could be considered as a tradition or the limited beginning of it. Nevertheless, if such a proposal is found to be impractical according to our general views as presented in this paper, it is abandoned.

(8) In accordance with the Rules genera whose type species have been indicated by their author are rigidly based on this particular species, and the type species cannot at present be altered any more than the following list of lectotypes could be altered once it has been accepted by an International Congress dealing with questions of nomenclature. Such genera are therefore omitted from the following list unless the evidence of a type species has been overlooked or ignored by later authors not adhering to the type method or not applying it.

LIST OF PROPOSED LECTOTYPES OF THE GENERA OF AGARICS

(Species lectotypica proposita Agaricinearum)

I. Ex Fries, Systema Mycologicum 1. 1821.

1. AGARICUS L. ex Fr. Syst. Myc. 1: 5. 1821. *A. campestris* L. ex Fries.

Discussion of lectotype:[6] Since *Agaricus* must be maintained as a genus according to Art. 51 of the International Rules it is

[6] The paragraphs *Discussion of lectotype* and *Status of generic name* are not intended to be part of the proposal to be submitted for official acceptance. They are merely an explanation of the reasons motivating some of our proposals and a conclusion showing their consequences. We hope this will facilitate reciprocal understanding and more efficacious discussions between now and the time these *species lectotypicae* are eventually acted upon.

best to follow established usage. Schroeter's emendation of *Agaricus* has never been widely accepted. Since the emendation proposed by Karsten and also by Saccardo has come into general use the world over it is the one we recognize. Consequently a species of the tribus *Psalliota* Fr. is chosen.

Status of generic name: Valid; genus generally accepted by taxonomists.

2. CANTHARELLUS *Adans.* ex Fr. *l.c.* p. 316. *C. cibarius* Fries.

Discussion of lectotype: Any other choice would exclude *C. cibarius* from the genus in the sense of some modern classifications. This would be contrary to tradition and impractical since a new generic name for *C. cibarius* would be required.

Status of generic name: Valid; genus generally accepted by taxonomists.

3. SCHIZOPHYLLUM Fr. *l.c.* p. 330. *S. commune* Fries.

Status of generic name: Valid; genus generally accepted by taxonomists.

II. Ex S. F. Gray, Natural Arrangement of British Plants 1. 1821.

4. AMANITA Pers. ex Gray, *l.c.* p. 599. *A. bulbosa* Schaeff. ex Gray.

Discussion of lectotype: *A. bulbosa* is a synonym of *Agaricus phalloides* Fries, Syst. Myc. **1**: 13. 1821. Thus the name clearly indicates a homogeneous group of species with amyloid spores and membranous volvas. These belong in the subgenus *Euamanita* of recent classifications. Our selection of *A. bulbosa* is logical since it preserves the tradition associated with the name and is in line with modern usage. The other species included by Gray are either not so clearly in a distinct group (*A. citrina*) or they belong to other groups of *Amanita* with the volva more poorly developed or even absent.

Status of generic name: Valid; genus generally accepted by taxonomists.

5. VAGINATA Nees v. Esenb. ex Gray, *l.c.* p. 601. *V. livida* (Pers.) ex Gray.

Discussion of lectotype: *Amanita livida* Pers. is the same as *Agaricus vaginatus* Bull. according to Gray himself. This is *Amanita vaginata* or *Amanitopsis vaginata* of modern authors. Gray included three species in his assemblage, one of which is a *Volvaria* or *Volvariopsis*. Since the other two species are white spored it is logical to make the selection from them, particularly since this concept already exists in the literature. Murrill used Gray's name in the North American Flora and designated *V. livida* as the type.

Status of generic name: Valid; genus accepted by some taxonomists.

6. LEPIOTA (Pers.) ex Gray, *l.c.* p. 601. *L. colubrina* (Pers.) ex Gray.

Discussion of lectotype: It should be selected from among the species included by Gray, but not from those which have been placed in other genera by recent authors. This excludes *L. procera, L. granulosa, L. squarrosa, L. aurea, L. polymyces, L. caudicina* and *L. helvola*. The only acceptable species is *L. colubrina* which is considered a synonym of *L. clypeolaria* and is therefore consistent with the senior author's earlier proposal.

Status of generic name: Valid; genus generally accepted by taxonomists.

7. GYMNOPUS (Pers.) ex Gray, *l.c.* p. 604. *G. purus* (Pers. ex Fr.) Gray.

Discussion of lectotype: Since this choice does not invalidate well established names such as *Collybia, Hygrophorus, Tricholoma*, etc. and yet connects the name to a group of species which is rather distinct and which eventually might be recognized as a genus by some workers, it appears to be the logical choice. At the present time it would be considered a synonym of *Mycena* by those who maintain the genus either in the concept of Kühner or Singer.

Status of generic name: Valid; genus at present considered a synonym of *Mycena*.

8. OMPHALIA (Pers.) ex Gray, *l.c.* p. 611. *O. adusta* (Pers. ex Fr.) Gray.

Discussion of lectotype: *O. adusta* appears to be the only choice not endangering such well established names as *Collybia, Clitocybe, Laccaria, Paxillus,* etc. There is no species in Gray's assemblage or for that matter Persoon's either, that belongs in *Omphalia* (Fr.) Quél. 1872. On the basis of our selection, *Omphalia* becomes a synonym of *Russula. O. adusta* as cited by Gray is a combination of *Russula nigricans* (Bull. ex Fr.) Fr. and *R. adusta* (Pers. ex Fr.) Fr. sensu str. Fr. and probably *R. densifolia* (Secr.) Gill. All these belong to the section *Compactae* of *Russula. Omphalia* (Fr.) Quél. must be replaced by *Omphalina* Quélet.

Status of generic name: Valid; but type species generally considered congeneric with type of *Russula.* The legal status of both names is identical but we prefer *Russula* according to general usage.

9. PLEUROPUS (Pers.) ex Gray, *l.c.* p. 615. *P. fornicatus* Pers. ex Gray.

Discussion of lectotype: No matter which species in Gray's assemblage is selected one of the well established genera (*Clitopilus, Lyophyllum, Rhodotus* or *Panus*) would be invalidated. *Panus* is the only one that apparently is represented by more than one species, and is the only one of the four previously proposed for conservation for other reasons (see p. 292). Therefore we have selected *P. fornicatus* as lectotype. This makes *Panus* a synonym of *Pleuropus* unless it is conserved by the Congress.

Status of generic name: Valid, unless rejected in favor of *Panus* which we propose for conservation.

10. CREPIDOPUS Nees v. Esenb. ex Gray, *l.c.* p. 616. *C. ostreatus* (Jacq. ex Fr.) Gray.

Discussion of lectotype: A selection of any one of the five species included by Gray would result in the substitution of *Crepidopus* for one of the well known genera. Consequently we are merely following Murrill who selected *Agaricus ostreatus* as the type.

Status of generic name: Valid, unless rejected in favor of *Pleurotus,* which we propose for conservation.

11. APUS Nees v. Esenb. ex Gray, *l.c.* p. 617. *A. alneus* L. ex Gray.

Discussion of lectotype: *A. alneus* is a synonym of *Schizophyllum commune.*

Status of generic name: Synonym of *Schizophyllum* (same type).

12. RESUPINATUS Nees v. Esenb. ex Gray, *l.c.* p. 617. *R. applicatus* (Batsch ex Fr.) Gray.

Discussion of lectotype: This is *Pleurotus applicatus* or *Scytinotopsis applicata* of present nomenclature.

Status of generic name: Valid; genus accepted by some modern authors (under names which are later synonyms).

13. RUSSULA Pers. ex Gray, *l.c.* p. 618. *R. lutea* (Huds. ex Fr.) Gray.

Status of generic name: Valid; genus accepted generally by taxonomists.

14. MYCENA (Pers.) ex Gray, *l.c.* p. 619. *M. galericulata* (Scop. ex Fr.) Gray.

Discussion of lectotype: The largest element in Gray's assemblage is clearly *Mycena* in the Friesian sense. It is therefore desirable to choose one of the species belonging to the genus in its most restricted sense and at the same time the one most common and completely known. This is *M. galericulata.* It is also the species already accepted in the literature as the type species.

15. MICROMPHALE (Nees v. Esenb.) ex Gray, *l.c.* p. 621. *M. venosum* Pers. ex Gray.

Discussion of lectotype: *Micromphale venosum* is a synonym of *Marasmius foetidus* or *Heliomyces foetidus* of present taxonomists. This name would therefore replace either *Marasmius* Fr. or *Heliomyces* sensu Singer, 1936, depending on whether the *M. foetidus*-group is separated from the bulk of *Marasmius* or left within it. *Micromphale* Gray would be extremely unwelcome as a name for

all species of *Marasmius* (which it would replace if some other species were chosen), but it would be welcome as a substitute for *Heliomyces* sensu Singer since the latter would have to be renamed anyway because the group is generically different from the type species of *Heliomyces* in the original sense. Two species in *Micromphale* Gray belong to *Heliomyces* sensu Singer (*Marasmius*, section *Gloeonemi* Kühner), whereas two others belong in *Marasmius* sensu str. The other species in Gray's assemblage consist of still smaller elements not very closely related to *Marasmius*. If *M. venosum* is chosen as lectotype a new generic name for *Heliomyces* sensu Singer becomes unnecessary. The name *Micromphale* will not interfere by virtue of its priority with established generic names unless *Marasmius* is understood in the broad sense. For a discussion of this situation and our recommendation see p. 295.

Status of generic name: Valid. In the sense of *Heliomyces* Singer 1936 and Maire 1937 it is an acceptable genus. As a substitute for *Marasmius* Fries it is not wanted. We propose that *Marasmius* Fries be conserved against it *only* when *Marasmius* is used in the broad Friesian concept.

16. LACTARIUS D. C. ex Gray, *l.c.* p. 623. *L. deliciosus* (L. ex Fr.) Gray.

Discussion of lectotype: We decided in favor of the best known and most widely used species, see principle (6), p. 246.

Status of generic name: Valid; genus generally accepted by taxonomists.

17. PRATELLA (Pers.) ex Gray, *l.c.* p. 626. *P. campestris* (L. ex Fr.) Gray.

Discussion of lectotype: This is the most widely known species of the genus and with certainty referable to a generic group that has alternately been called *Psalliota*, *Pratella* and *Agaricus*. We recommend the use of the name *Agaricus*, see genus 1.

Status of generic name: A synonym of *Agaricus* L. ex Fr. (same type).

18. CORTINARIA (Pers.) ex Gray, *l.c.* p. 627. *C. violacea* (Bolt. ex Fr.) Gray.

Discussion of lectotype: The lectotype we propose belongs to the largest element of *Cortinaria* Gray and is consistent with the senior author's and other writers' previous proposals.

Status of generic name: Valid, but we propose *Cortinarius* Fr. for conservation.

19. PRUNULUS Ces. ex Gray, *l.c.* p. 630. *P. extinctorius* Bolt. ex Gray.

Discussion of lectotype: Apparently *P. extinctorius* is the only possible binomial in Gray's assemblage which if selected would not endanger or replace established generic names.

Status of generic name: Valid, but type species generally considered congeneric with type of *Coprinus* (Pers.) ex Gray. The latter and *Prunulus* therefore have the same nomenclatorial status, but we prefer *Coprinus* according to general usage.

20. COPRINUS (Pers.) ex Gray, *l.c.* p. 632. *C. comatus* (Pers. ex Fr.) Gray.

Discussion of lectotype: *C. comatus* is undoubtedly the most widely used and best known species and is quite in accordance with the generic description.

Status of generic name: Valid; genus generally accepted by taxonomists. We prefer it to *Prunulus*.

21. ASTEROPHORA Ditm. ex Gray, *l.c.* p. 635. *A. lycoperdoides* Bull. ex Gray.

Status of generic name: Valid. In our estimation it should be accepted in preference to *Nyctalis* over which it has priority.

22. MERULIUS Gray, *l.c.* p. 636. *M. aurantiacus* (Wulf. ex Fr.) Gray.

Status of generic name: A later homonym of *Merulius* Fr. 1821.

23. CORNIOLA Gray, *l.c.* p. 637. *C. lobata* (Pers. ex Fr.) Gray.

Status of generic name: A later homonym of *Corniola* Adans. 1763.

24. GOMPHUS Gray, *l.c.* p. 638. *G. clavatus* (Pers. ex Fr.) Gray.

Status of generic name: Valid; genus accepted by some modern taxonomists (Maire, Singer, Heim, etc.), sometimes under names which are later synonyms, such as *Neurophyllum*. By some authors considered a synonym of *Cantharellus*.

III. Ex Fries, Stirpes Agri Femsionensis III. 1825.

25. GALORRHEUS Fr. *l.c.* p. 56. *G. deliciosus* (L. ex Fr.) Fr.

Status of generic name: Synonym of *Lactarius* (same type).

26. LENTINUS Fr. *l.c.* p. 57. *L. lepideus* Fr.

Discussion of lectotype: Of the two species mentioned here we selected *L. lepideus* for historic reasons, see principle (5), p. 246.

Status of generic name: Valid; genus generally accepted by taxonomists.

27. NYCTALIS Fr. *l.c.* p. 58. *N. parasiticus* (Bull. ex Fr.) Fr.

Status of generic name: Type species generally considered to be congeneric with the type species of *Asterophora* Ditm. ex Gray. The latter has priority.

IV. Ex Fries, Systema Orbis Vegetabilis. 1825.

28. XEROTES Fr. *l.c.* p. 78. Type not indicated, no species mentioned.

Status of generic name: A hyponym. The genus is too poorly characterized to be linked with anything now known and no type is mentioned; also a homonym of *Xerotes* R. Br. (1810).

V. Ex Fries, Elenchus Fungorum. 1828.

29. XEROTUS Fr. *l.c.* p. 48. *Xerotus afer* Fr.

Status of generic name: Valid.

VI. Reichenbach, Conspectus Regni Vegetabilis. 1828.

30. XEROTINUS Reichenb. *l.c.* p. 14.

Status of generic name: Same as for *Xerotes*.

VII. Ex Wallroth, Flora Cryptogamica Germaniae 2. 1833.

31. RHIPIDIUM Wallr. *l.c.* p. 742. *R. stypticum* Wallr.

Discussion of lectotype: *R. stypticum* Wallr. is a synonym of *Schizophyllum commune* (in contrast with the usual erroneous citation of it as a synonym of *Panellus stypticus*).

Status of generic name: A homonym of several older genera in addition to being a synonym of *Schizophyllum* (same type).

VIII. Ex Fries, Genera Hymenomycetum. 1836; Epicrisis 1836–38 (genera mentioned here published in 1838).

a). Genera Hymen. 1836.

32. CORTINARIUS Fr. *l.c.* p. 7. *C. violaceus* (L. ex Fr.) Fr.

Status of generic name: Originally (1836) a hyponym, but later validated by Fries (1838). However, *Cortinaria* Gray is based on the same type and has priority (1821 as against 1838). *Cortinaria* Gray is not a variant spelling according to the Rules. If the masculine gender (spelling *Cortinarius*), which has been used since 1838 with but very few minor exceptions, is to be retained, it must be accepted by the Congress. We propose *Cortinarius* for conservation.

33. GOMPHIDIUS Fr. *l.c.* p. 8. *G. glutinosus* (Schaeff. ex Fr.) Fr.

Status of generic name: Valid; genus generally accepted by taxonomists.

34. HYGROPHORUS Fr. *l.c.* p. 8. *H. eburneus* (Bull. ex Fr.) Fr.

Status of generic name: Valid; genus generally accepted by taxonomists in either a broad or restricted sense.

35. MARASMIUS Fr. *l.c.* p. 9. *Marasmius rotula* (L. ex Fr.) Fr.

Discussion of lectotype: In our opinion, none of the species subsequently separated from *Marasmius* when the latter was restricted by the exclusion of various groups should be proposed as lectotype. Therefore *Marasmius,* sect. *Rotulae* Kühn. (*Marasmius*

sensu Earle), is the one section from which a lectotype should be chosen. We have proposed the best known and most widely distributed species of that section. Since in our opinion *Marasmius rotula* and *M. foetidus* are not congeneric, there is no need to conserve *Marasmius* against *Micromphale*. However, others may not agree and for them it is imperative to propose *Marasmius* for conservation (see discussion, p. 295).

Status of generic name: Valid; genus generally accepted by taxonomists in either a broad or restricted sense. The type species is considered by some to be generically identical with the type species of *Micromphale* and in this concept *Marasmius* is in need of conservation. We recommend that it be so conserved.

36. TROGIA Fr. *l.c.* p. 10. *Cantharellus aplorutis* Mont.

Discussion of lectotype: This species is indicated as the type by Fries himself, and we list it here only because this fact has been overlooked, and some authors treat *Trogia* in a manner which suggests *T. crispa* as the type species.

Status of generic name: Valid; genus generally accepted by taxonomists.

37. LENZITES Fr. *l.c.* p. 10. *Lenzites betulina* (L. ex Fr.) Fr.

Discussion of lectotype: The selection of the type has been made in accordance with the established usage by investigators of the polypores, thus excluding the representatives of what was later transferred to *Gloeophyllum*.

Status of generic name: Valid, and genus generally accepted by taxonomists but now almost unanimously excluded from the Agaricineae.

38. PLUTEUS Fr. *l.c.* p. 6. *Agaricus pluteus* Batsch ex Fr. syn. excl.

Discussion of lectotype: Fries' remarks, *l.c.*, admit as candidates for the lectotype several species given in *Systema Mycologicum*. It appears obvious that *A. pluteus* must have been the species most intimately linked with his idea of the genus *Pluteus*, hence the name. Therefore, there was no other reasonable choice. Since

A. pluteus is a synonym of what we now correctly[7] call *Pluteus cervinus* (Schaeff. ex Fr.) Quélet, we may add that our lectotype is also the most widely known and distributed species of the genus, and, in addition, the only one that is to some extent used as an edible mushroom. We must, however, add "synonymis exclusis" when citing *A. pluteus* since in 1821 Fries apparently still confused this species with two belonging in *Entoloma* (*Rhodophyllus* of modern classifications). These were *A. lividus* and *A. clypeatus*. Fries corrected himself later in this regard, and it is obvious that these synonyms were indicated by mistake.

Status of generic name: Valid; genus generally accepted by taxonomists.

39. PAXILLUS Fr. *l.c.* p. 8. *P. involutus* (Batsch ex Fr.) Fr.

Discussion of lectotype: Fries indicates *P. involutus* as the type.

Status of generic name: Valid, unless *Ruthea* Opat. has a slight priority over it. *Paxillus* is generally accepted as valid by taxonomists and we have proposed it for conservation.

b). Epicrisis 1838.

40. PANUS Fr. Epicrisis, p. 396. *P. conchatus* (Bull. ex Fr.) Fr.

Discussion of lectotype: It is necessary to select one of the species not transferred to *Panellus* by Karsten and his followers, and not transferred to *Lentinus* by any who admit the genus *Panus*. In this case only *Panus torulosus* and *P. conchatus* are available as possible lectotypes, and we selected the latter since the two are identical and *L. conchatus* appears to be the preferred name.

Status of generic name: Synonym of *Pleuropus* (Pers.) ex Gray but proposed for conservation by Maire.

41. *Bolbitius* Fr. *l.c.* p. 253. 1838. *B. fragilis* (L. ex Fr.) Fr.

Status of generic name: Valid; genus generally accepted by taxonomists.

[7] See Art. 68.3 of International Rules. *A. pluteus* cannot be legally transferred to the genus *Pluteus* without a change in the species epithet. This change was proposed by Fries when he took up a name of Schaeffer.

IX. Ex Léveillé, Annales des Sciences Naturelles III. 2. 1844.

42. *Heliomyces* Lév. *l.c.* p. 177. *H. elegans* Lév.

Status of generic name: Valid, but in our opinion the type and all other species originally included are congeneric with the type species of *Marasmius*. As for *Heliomyces* sensu Sing. 1936 and Maire 1937, see p. 295.

X. Ex Rabenhorst, Deutschlands Kryptogamen-Flora 1. 1844.

43. *Rhymovis* Rab. *l.c.* p. 572. *R. involutus* (Batsch ex Fr.) Rab.

Status of generic name: Synonym of *Paxillus* (same type). The genus *Rhymoxis* Pers. (not *Rhymovis* which was a printer's error) was proposed by Persoon conditionally, i.e. it was not validly published. Rabenhorst, though misspelling it, tried to validate it. However, in the meantime other genera had been published for the same species, i.e. *Ruthea* and *Paxillus*.

XI. Ex Montagne, Cryptogamia Guyanensis, Annales des Sciences Naturelles IV. 1. 1854.

44. HIATULA (Fr.) Mont. *l.c.* p. 107. *H. Benzonii* (Fr.) Mont.

Status of generic name: Valid; genus accepted by many taxonomists. Some authors recognize *Leptomyces* Mont. rather than *Hiatula* (Fr.) Mont. but it should be remembered that Montagne used *Hiatula* as a genus two years before he erected his own genus, *Leptomyces*. His first mention of it (*l.c.* p. 107) must refer to manuscript notes, but he also mentions *H. Benzonii* (*l.c.*).

XII. Ex Montagne, Sylloge Cryptogamarum. . . . 1856.

45. LEPTOMYCES Mont. *l.c.* p. 128. *L. lignifraga* (Mont.) Mont.

Status of generic name: Valid, but Montagne himself suspected that it was the same as *Hiatula*, and it is not accepted by any author thus far as different. We consider it a synonym of *Hiatula*.

XIII. Ex Peck, Annual Report N. Y. State Museum 24. 1872.

46. PLICATURA Peck, *l.c.* p. 75. *P. Alni* Peck.

Status of generic name: Valid; the genus belongs in the Meruliaceae. It is accepted by some authors in the sense of *Trogia* auct. non Fries, but considered as a synonym of *Merulius* by others. If *P. Alni* Peck is considered a true *Merulius*, and the group around *"Trogia" crispa* considered to be generically different from *Merulius*, the genus *Pleurotopsis* (Henn.) Earle is still available as a generic name for *P. crispa* and *P. spodoleuca*.

XIV. Ex Quélet, Champignons du Jura et des Vosges. 1872–73.

47. ARMILLARIA (Fr.) Quél. *l.c.* p. 74. *Agaricus luteovirens* A. & S. ex Fries, Monogr.

Discussion of lectotype: see our principle (3), p. 245.

Status of generic name: Valid; genus generally accepted but under varying concepts depending on the author.

48. TRICHOLOMA (Fr.) Quél. *l.c.* p. 76. *T. equestre* (L. ex Fr.) Quél.

Discussion of lectotype: According to our principle (3) we have excluded from consideration any species which belongs in one of the groups which have since been segregated from *Tricholoma*, i.e. *Melanoleuca, Leucopaxillus, Lyophyllum, Cortinellus, Rhodopaxillus, Tricholomopsis*, and *Calocybe*. In order to be consistent with Fries' concept of *Tricholoma* we must select a species from the section *Tricholomata Genuina* Fr. (Syst. Myc.). Undoubtedly the best known species is *Agaricus flavovirens*, a synonym of what Fries later (in Monographia Suec.) called *Agaricus equestris*, and Quélet *Tricholoma equestris*. This choice of lectotype is in accord with the senior author's former (1936) proposal. When Fries transferred this species to the section *Limacina* (1836), he abandoned at the same time his old section *Genuina*.

Status of generic name: A homonym of *Tricholoma* Benth. (1820), but *Tricholoma* (Fr.) Quél. has been proposed for conservation.

49. CLITOCYBE (Fr.) Quél. *l.c.* p. 85. *C. infundibuliformis* (Schaeff. ex Fr.) Quél.

Discussion of lectotype: We chose as lectotype one of the species most typical of the genus. *C. nebularis* and *C. odora* do not have truly white spore deposits and *C. laccata* was transferred to *Laccaria* long ago. *C. infundibuliformis*, in addition, is widely distributed and well known.

Status of generic name: Valid; genus generally accepted by taxonomists.

50. COLLYBIA (Fr.) Quél. *l.c.* p. 92. *C. dryophila* (Bull. ex Fr.) Quél.

Discussion of lectotype: Many species of *Collybia* do not have pure white spores. All of these, of course, should be excluded from consideration. This eliminates *C. butyracea* and *C. maculata*. We have selected the best known and most widely distributed species that answers perfectly to the generic description. It is important that no species used as the type of recently segregated genera be considered. This eliminates *C. esculenta, C. myosura, C. lacerata, C. longipes, C. radicata,* and *C. velutipes*.

Status of generic name: Valid; genus generally accepted by taxonomists.

51. OMPHALIA (Fr.) Quél. *l.c.* p. 99. *O. umbellifera* (L. ex Fr.) Quél.

Discussion of lectotype: (see under *Omphalina* Quél.).

Status of generic name: A homonym of *Omphalia* (Pers.) ex Gray.

52. PLEUROTUS (Fr.) Quél. *l.c.* p. 62.[8] *P. ostreatus* (Jacq. ex Fr.) Quél.

Discussion of lectotype: If all species transferred to or belonging to such modern genera as *Geopetalum* (*Acanthocystis*), *Pleurotellus* (*Calathinus*), *Resupinatus* (*Scytinotopsis*), *Rhodotus, Phyllotopsis, Lyophyllum, Tricholomopsis,* etc. are excluded from consideration, it appears obvious that the lectotype has to be selected from the *P. dryinus*-group (as is suggested by Murrill in North

[8] Spelled *Pleurote* on p. 111.

American Flora), or from the *P. ostreatus*-group. Historically both solutions would be equally correct. We decided in favor of *P. ostreatus* because of its importance in commerce (edible mushroom, imported to China from various Asiatic territories, and an ever-present element in almost all the floras of the world). Also, its complicated sexuality as studied by Vandendries makes it an outstanding type among the Basidiomycetes and consequently an important subject for teaching. There is only one fact that might be brought up against its selection as lectotype, namely its slightly (drab) colored spores. However, there is no well known species among the Pleuroti of the *ostreatus*-group which has unquestionably pure white spores in a good deposit on white paper. Since the color of the deposit is not always evident at the moment one removes the cap from the paper, and since it is often almost too slight to notice, it does not seem wise to allow this consideration to carry more weight than all the others combined.

Status of generic name: Synonym of *Crepidopus* Nees v. Esenb. ex Gray but proposed for conservation.

53. VOLVARIA (Fr.) Quél. *l.c.* p. 114. *V. speciosa* (Bull. ex Fr.) Quél.

Status of generic name: This is a homonym of *Volvaria* DC (1805), but has been proposed for conservation by R. Maire.

54. ENTOLOMA (Fr.) Quél. *l.c.* p. 116. *E. lividum* (Bull. ex Fr.) Quél.

Status of generic name: Valid; however, for a generic name involving species of genera 54, 56, 57 and 58 the name *Rhodophyllus* Quél. is proposed for conservation, see p. 295.

55. CLITOPILUS (Fr.) Quél. *l.c.* p. 120. *C. prunulus* (Scop. ex Fr.) Quél.

Status of generic name: Valid; genus accepted generally by taxonomists (sometimes under the name *Hexajuga* Fayod).

56. LEPTONIA (Fr.) Quél. *l.c.* p. 121. *L. anatina* (Lasch) Quél.

Status of generic name: Valid; genus still recognized by some taxonomists.

57. NOLANEA (Fr.) Quél. *l.c.* p. 122. *N. pascua* (L. ex Fr.) Quél.

Status of generic name: Valid; genus still recognized by some taxonomists.

58. ECCILIA (Fr.) Quél. *l.c.* p. 123. *Agaricus* (*Eccilia*) *parkensis* Fr. in Monographia.

Status of generic name: Valid; genus still recognized by some taxonomists.

59. PHOLIOTA (Fr.) Quél. *l.c.* p. 124. *P. squarrosa* (Muell. ex Fr.) Quél.

Discussion of lectotype: *Pholiota* sensu Quélet contained a number of diverse groups of species many of which have since been recognized as genera. In our opinion the group to which the name *Pholiota* is inseparably attached both by usage the world over on the part of specialists and the general public is the *P. squarrosa* group. Many of these fungi are important to foresters because of the rots they cause, and many are commonly collected by people to be used as food. There is another reason for selecting the most strongly squarrose species as the type: The name applied by Fries suggests, as he himself has pointed out, the Greek word "pholis," i.e., scale. Thus the species placed in *Pholiota* logically should be scaly fungi. Also, the color of the spores is given as "ferruginea raro fulvo-ferruginea." This excludes such species as those belonging in *Agrocybe* and also those belonging in *Gymnopilus* (*Fulvidula*) as well as *Phaeolepiota, Rozites* and *Pholiotina*. A similar color distinction excludes the same groups of species in Quélet *l.c.*

Status of generic name: Valid; genus generally accepted by taxonomists. Overholts cites 1825 as the year of publication of Paulet's genus *Hypodendrum,* which he used in the North American Flora but not in his other publications. This should give *Hypodendrum* a solid priority over *Pholiota.* However, we know nothing of a generic description given by Paulet at the time cited by Overholts. Paulet called all agarics *Fungus* in his (pre-Friesian) text, and does not (though Murrill says he does) even

mention the genus *Hypodendrum*. When he published his plates, and these appeared over a long period of time—some not appearing until after his death—he must have changed his mind about the genera to be applied to his agarics because the common names in the text volumes are accompanied by Latin binomials or what appear to be binomials. But no word of Paulet's was found which would confirm that *Hypodendrum* or other generic names were actually meant to be new genera. Nor were these validated in Léveillé's edition of Paulet's plates. Léveillé applied the generic names of his time (mostly *Agaricus*) and gave Paulet's names as synonyms, a form of publication that is not valid according to the International Rules. In view of the confused situation in regard to the early use of the name *Hypodendrum*, and the fact that Overholts himself never used it in other publications on the genus, there is no advantage to be gained by establishing it, and the confusion which would result if it were established would be serious.

60. HEBELOMA (Fr.) Quél. *l.c.* p. 128. *H. fastibile* (Fr.) Quél.

Status of generic name: Valid; genus generally accepted by taxonomists.

61. *Flammula* (Fr.) Quél. *l.c.* p. 129. *F. flavida* (Schaeff. ex Fr.) Quél.

Discussion of lectotype: We exclude from consideration species from sections not typical according to the diagnoses given by Fries and Quélet (the Heterogenei and Sapinei). These have since been segregated as genera. This leaves the species *F. gummosa*, *F. flavida* and *F. azyma* in Quélet and a few more in Fries' Monographia. Earle based his genus *Visculus* on the section *Lubrici* but his intention was to give this group which he considered as *Flammula* proper a nomen novum. According to our principle (7), p. 247 we prefer *F. flavida*. This is the species indicated by Clements & Shear and by Singer and has also been recommended by the Nomenclature Commission of the British Mycological Society as one of two alternatives called "most suitable."

Status of generic name: A homonym of *Flammula* D. C. (1818), but proposed for conservation by R. Maire. Though it would be

most desirable to be able to conserve *Flammula* (Fr.) Quél. it may well be that intercommissional difficulties will arise over this question. In the end, it may be that a name for *Flammula* (Fr.) Quél. non D. C. is not so badly needed after all. We believe the generic differences between *Pholiota* and *Flammula* in the sense of modern authors are too small to justify the separation of these genera.

62. NAUCORIA (Fr.) Quél. *l.c.* p. 131. *Agaricus* (*Naucoria*) *centunculus* Fr.

Discussion of lectotype: The lectotype was chosen from Fries' Monographia in accordance with principle (5), p. 246.

Status of generic name: Valid; genus generally accepted by taxonomists.

63. GALERA (Fr.) Quél. *l.c.* p. 135. *G. hypnorum* (Batsch ex Fr.) Quél.

Discussion of lectotype: We do not agree with the statements and recommendations made in the Transactions of the British Mycological Society **23**: 228–229, nor do we support Maire's proposal to conserve *Galera* (see Discussion of Nomina generica conservanda proposita, p. 291). Since Fayod first emended *Galera* (see our principle (5), p. 246), the type species cannot be in the group which he designated a new genus. Among the species now called *Galerina* and still frequently referred to as section *Bryogenae* of *Galera*, the most widely distributed and common species is *G. hypnorum*.

Status of generic name: A homonym of *Galera* Blume (1825).

64. CREPIDOTUS (Fr.) Quél. *l.c.* p. 138. *C. mollis* (Schaeff. ex Fr.) Quél.

Status of generic name: Valid; genus generally accepted by taxonomists.

65. PSALLIOTA (Fr.) Quél. *l.c.* p. 139. *P. campestris* (L. ex Fr.) Quél.

Status of generic name: A synonym of *Agaricus* L. ex Fr. em. Karsten (same type).

66. STROPHARIA (Fr.) Quél. *l.c.* p. 141. *S. aeruginosa* (Curt. ex. Fr.) Quél.

Discussion of lectotype: The genus *Stropharia* is heterogeneous and this makes it important not to select a species belonging in *Psathyrella* or to Romagnesi's proposed new group *Stercophila*. Some species should not be selected because they are too close to *Naematoloma* Karsten. *S. aeruginosa* is the most easily recognized and commonest species, and one that has been studied from various points of view.

Status of generic name: Valid; genus generally accepted by taxonomists.

67. HYPHOLOMA (Fr.) Quél. *l.c.* p. 143. *H. Candolleanum* (Fr.) Quél.

Discussion of lectotype: If species belonging in groups which have been separated generically from *Hypholoma* are excluded there are only a few of the section *Appendiculati* available. The only one of these well enough known to be fit for selection is *H. Candolleanum*.

Status of generic name: Valid; genus accepted by some authors. Others consider the type congeneric with *Psathyrella*.

68. PSILOCYBE (Fr.) Quél. *l.c.* p. 147. *Agaricus semilanceatus* Fr. Monogr.

Discussion of lectotype: See our principle (3), p. 245.

Status of generic name: Valid; genus generally accepted by taxonomists though variously limited.

69. PSATHYRA (Fr.) Quél. *l.c.* p. 148. *P. spadiceogrisea* (Schaeff. ex Fr.) Quél.

Status of generic name: A homonym of *Psathyra* Spreng. (1818).

70. PANAEOLUS (Fr.) Quél. *l.c.* p. 151. *P. campanulatus* (L. ex Fr.) Quél.

Status of generic name: Valid; genus generally accepted by taxonomists.

71. PSATHYRELLA (Fr.) Quél. *l.c.* p. 152. *P. gracilis* (Fr.) Quél.

Status of generic name: Valid; genus generally accepted by taxonomists. Those who believe *Hypholoma* to be congeneric with *Psathyrella* will notice that the nomenclatorial status of *Hypholoma* and *Psathyrella* is the same, i.e., they were published validly in the same book and at the same date. However, in order to keep nomenclature as stable as possible, we strongly recommend *Psathyrella* in preference to *Hypholoma* because (1) the name *Hypholoma* has been used in two distinct senses and would thus be likely to cause confusion; (2) the name *Psathyrella* has been preferred by all modern taxonomists except Romagnesi (who does not use *Hypholoma* either); (3) *Hypholoma* has never been used in the sense of *Psathyrella* sensu Kühner or *Drosophila* sensu Romagnesi.

72. INOCYBE (Fr.) Quél. *l.c.* p. 178. *I. geophylla* (Sow. ex Fr.) Quél.

Discussion of lectotype: We chose a species with smooth spores and typical "Inocybe"-odor and "Inocybe"-cystidia. The species with nodulose or angular spores have—though in our opinion wrongly—been separated generically from *Inocybe* by several authors.

Status of generic name: Valid; genus generally accepted by taxonomists.

XV. Ex Gillet, Champignons de France, texte 1874–78 (Nos. 73–78 were published in 1876).

73. LEPISTA (Fr. p.p.) Gillet, *l.c.* p. 195. *L. Alexandri* Gill. (see No. 81 also).

Discussion of lectotype: It is necessary to choose between *L. Alexandri* and *L. truncata* in the selection of a lectotype. The selection of the latter would lead to numerous complications. *L. truncata* is now placed in *Rhodopaxillus* by many taxonomists and others still consider it a *Tricholoma.* We believe it would be unfortunate to replace *Rhodopaxillus* with *Lepista,* a name already used in so many different concepts that it may properly be designated a *nomen ambiguum.* Since the name *Tricholoma* is

not yet conserved it might happen, if favorable action is not taken, that *Lepista* (if *L. truncata* is selected as lectotype) would have to be substituted for it by those who retain a broad concept of *Tricholoma*. This would be very unfortunate. On the other hand, *L. Alexandri,* as the species is now generally delimited, is considered to be a *Clitocybe* and *Clitocybe* has definite priority over *Lepista*. Consequently other generic names would not be endangered if it is selected.

It may be asked whether it is correct to select the type species from Gillet instead of from Fries. In the case of Quélet we insisted that the species had to be one included in the two Friesian works cited by Quélet. In the case of Gillet, however, we cannot find any indication of whether or not the genus is understood in the sense of any one of Fries' works, even though Fries is mentioned as the authority. It is obvious that Gillet had more knowledge of *L. Alexandri* than of *L. truncata,* and it appears to us that he included more characters of the former than of the latter in the generic diagnosis. It is also worthy of note that in Hymenomycetes Europaei Fries included *L. Alexandri* in the genus *Paxillus,* tribe *Lepista*. If, for some reason, it be insisted that the lectotype be designated a species that is found in Epicrisis, we would propose *Paxillus extenuatus*. In Ricken's sense, and we agree with Ricken, this is the same as *L. Alexandri*. Because there is some disagreement over the concept of *P. extenuatus* it could then be regarded as a dubious species and *Lepista* discarded as a *nomen ambiguum*.

Status of generic name: With *L. Alexandri* as lectotype it is valid but a synonym of *Clitocybe*.

74. ANNULARIA (Schulz.) Gill. *l.c.* p. 389. *A. Fenzlii* (Schulz.) Gill.

Status of generic name: A homonym of *Annularia* Sternb. (1823).

75. CLAUDOPUS (Fr.) Gill. *l.c.* p. 426. *C. byssisedus* (Pers. ex Fr.) Gill.

Discussion of lectotype: It was necessary to exclude *C. variabilis* from consideration because it was segregated by Patouillard

under a different generic name. Ricken, 1913, was the first to emend the genus *Claudopus* by excluding all species with non-angular spores. This makes it doubly necessary to confine ourselves to species with angular spores when considering a lectotype. Of these *C. byssisedus* is certainly the best known and most widely distributed representative.

76. LOCELLINA Gill. *l.c.* p. 428. *L. Alexandri* Gillet.

Status of generic name: Valid; but the type species is dubious.

77. PLUTEOLUS (Fr.) Gill. *l.c.* p. 549. *P. reticulatus* (Fr.) Gill.

Status of generic name: Valid; genus accepted by some taxonomists.

78. TUBARIA (W. G. Smith) Gill. *l.c.* p. 537. *T. furfuracea* (Fr.) Gill.

Discussion of lectotype: It is important not to select any species recently transferred to other genera such as *Galerina* (*Galera*) or *Deconica*. The best known, the most common, and the one already proposed by other investigators is *T. furfuracea*.

Status of generic name: Valid; genus generally accepted by taxonomists.

XVI. Ex Roze, Bulletin de la Société Botanique de France. 1876.

79. AMANITOPSIS Roze, *l.c.* p. 51. *A. vaginata* (Bull. ex Fr.) Quél.

Discussion of lectotype: The author of the genus refers to the section *Amanitae Vaginatae*, a name which implies *A. vaginata* as the type species.

Status of generic name: A synonym of *Vaginata* Nees v. Esenb. ex Gray (same type).

80. CORTINELLUS Roze, *l.c.* p. 51. *Agaricus* (*Tricholoma*) *vaccinus* Fr.

Discussion of lectotype: The type species was indicated by Roze himself and we include the genus here only because that type has been disregarded in later emendations.

Status of generic name: Valid; but genus not generally recognized in the above sense. With *A. vaccinus* as lectotype most taxonomists would consider the genus a synonym of *Tricholoma.*

81. LEPISTA (Fr.) Roze, *l.c.* p. 51. *L. gilva* (Pers. ex Fr.) Roze.

Discussion of lectotype: The priority of the raised status of *Lepista* (Fr.) is very difficult to establish. *Lepista* (Fr.) Gillet and *Lepista* (Fr.) Roze must have both been published in 1876. In case Roze has priority, the status of the genus would be nomenclatorially valid but congeneric with *Clitocybe* though associated with a different group of species in that genus than *Lepista* (Fr.) Gillet. The same alternate solution proposed for *Lepista* (Fr.) Gillet could also be applied here.

Status of generic name: A synonym of *Clitocybe.*

XVII. Ex Karsten, Bidr. Finl. Nat. Folk 32: 1–571 (Hattsvampar). 1879.

82. PANELLUS Karst. *l.c.* p. xiv. *P. stypticus* (Bull. ex Fr.) Karst.

Status of generic name: Valid; genus accepted by many modern taxonomists.

83. PHYLLOTUS Karst. *l.c.* p. xiv. *P. applicatus* (Batsch ex Fr.) Karst.

Discussion of lectotype: This genus as recognized by Karsten contained species of at least three of the groups since recognized as genera by later authors and because of this heterogeneity was not accepted by other investigators. For those who retain a broad concept of *Pleurotus,* the genus will always be regarded as a synonym no matter which species is selected. The expedient least inconvenient for those who split *Pleurotus* into smaller genera is to select a lectotype which will unquestionably reduce *Phyllotus* to synonymy under an earlier name. Since one of the most clearly delimited groups in Karsten's assemblage is the *P. applicatus* group it is a logical procedure to select the principal species of it as lectotype. The genus then becomes a synonym of *Resupinatus*

S. F. Gray as does *Scytinotopsis* Singer which is based on the same type.

84. SCYTINOTUS Karst. *l.c.* p. xiv. *S. ringens* (Fr.) Karst.

Status of generic name: Valid; but genus considered congeneric with *Panus* by conservative taxonomists and congeneric with *Panellus* according to the others.

85. CAMAROPHYLLUS (Fr.) Karst. *l.c.* p. xvii. *C. pratensis* (Pers. ex Fr.) Karst.

Status of generic name: Valid; genus accepted by some taxonomists.

86. HYGROCYBE (Fr.) Karst. *l.c.* p. xvii. *H. miniata* (Fr.) Karst.

Status of generic name: Valid; genus accepted by some taxonomists.

Note: it is obvious that the spelling *Hydrocybe* is merely a printer's error inasmuch as Fries is cited and Fries consistently spelled it *Hygrocybe.*

87. LEPTOTUS Karst. *l.c.* p. xvii. *L. retirugis* (Fr.) Karst.

Status of generic name: Valid; genus accepted by taxonomists under various names (*Leptoglossum,* see no. 88; or *Dictyolus,* a later synonym).

88. LEPTOGLOSSUM Karst. *l.c.* p. xvii. *L. muscigenum* (Batsch ex Fr.) Karst.

Status of generic name: This was published the same year as the Discomycete genus *Leptoglossum,* and the priority is hard to establish. However, the type species of *Leptoglossum* Karst. according to nearly all taxonomists is congeneric with the type of *Leptotus* and the latter name can be used.

89. LENTINELLUS Karst. *l.c.* p. xviii. *L. cochleatus* (Fr.) Karst.

Discussion of lectotype: *L. cochleatus* is undoubtedly the best known species of this genus and the most representative.

Status of generic name: Valid; genus accepted by some taxonomists.

90. HEMICYBE Karst. *l.c.* p. xviii. *H. ursina* (Fr.) Karst.

Status of generic name: Valid; but genus not accepted by taxonomists. It is thought that the lectotype of *Hemicybe* is congeneric with that of *Lentinellus* and the latter is preferred.

91. ROZITES Karst. *l.c.* p. xx. *R. caperata* (Pers. ex Fr.) Karst.

Status of generic name: Valid; genus accepted by many taxonomists.

92. GYMNOPILUS Karst. *l.c.* p. xxi. *G. liquiritiae* (Pers. ex Fr.) Karst.

Discussion of lectotype: Of the three species originally included by Karsten, two obviously belong in what Romagnesi calls *Fulvidula,* i.e., the section *Sapineae* of *Flammula.* The other is the one Maire transferred to *Rhodotus.* Thus it is logical to propose a species of *Fulvidula* as lectotype. Otherwise the well established and widely accepted genus *Rhodotus* would be replaced by *Gymnopilus.* This name has never been used in this sense, though it has been used in place of *Flammula.* The choice, then, is between *G. liquiritiae* and *G. picreus.* Since Murrill also prefers *G. liquiritiae* we decided in favor of it. Since Murrill used the name *Gymnopilus* for *Flammula,* not many transfers will need to be made as a result of abandoning *Fulvidula.*

Status of generic name: Valid; genus accepted by many modern taxonomists (sometimes under the name *Fulvidula*).

93. GYMNOCYBE Karst. *l.c.* p. xxii. *G. Weinmannii* (Fr.) Karst.

Discussion of lectotype: None of the species included by Karsten gives a clear idea of what that author had in mind—if anything definite—when he described the genus. *G. Weinmannii* is based on a species of Weinmann which is incompletely known. The senior author was unable to rediscover the fungus in the type locality, or to find it in the herbarium among other specimens left

by Weinmann. *G. Tammii* is either *Phylloporus rhodoxanthus* ssp. *europaeus* Sing. or, in our opinion, a *Gymnopilus*. *Gymnocybe abrupta* and *G. muricella* are both somewhat dubious species.

Status of generic name: Valid; genus based on a dubious species; therefore the genus is dubious also, particularly since it appears improbable that the type of the species can be found and restudied.

94. PHIALOCYBE Karst. *l.c.* p. xxii. *P. epibrya* (Fr.) Karst.

Discussion of lectotype: Both species included by Karsten are dubious both as to their characters and their generic position.

Status of generic name: Valid; but genus not accepted by taxonomists. It should be regarded as dubious unless a study of the type of the above species clarifies its generic position. (It appears improbable that this can be done.)

95. SIMOCYBE Karst. *l.c.* p. xxii. *S. centunculus* (Fr.) Karst.

Discussion of lectotype: We propose the above name in order to reduce the genus to synonymy with *Naucoria* in the restricted sense of the latter genus. To be consistent with Karsten's concept would require that *Simocybe* be regarded as a synonym of *Naucoria* in the broad (Friesian) sense, since his division as made left the bulk of the species in *Simocybe* and very few in *Naucoria*. It should also be pointed out that both *Simocybe* and *Naucoria* sensu Karsten contain species now placed in *Naucoria* sensu Singer, the most restricted concept of *Naucoria* yet proposed. Thus the situation here is exactly the opposite of that found for *Naematoloma* and *Hypholoma*—where Karsten did establish clear generic concepts.

Some may take the attitude that a species of the group now recognized as *Phaeocollybia* should be selected as lectotype for *Simocybe* since that group (*Naucoria lugubris* and related species) is the first distinct group given by Karsten in his account of the genus. Although we feel obligated to mention this situation here we believe that it would be unfortunate to accept *N. lugubris* or a related species as lectotype since doing so would resurrect a long-buried name which, in the concept in which it was originally proposed, was meaningless as far as the clarification of *Naucoria*

(Fr.) Quél. was concerned. Such a selection would violate our principle (5).

Status of generic name: A synonym of *Naucoria* if *N. centunculus* is accepted as lectotype.

96. GALERULA Karst. *l.c.* p. xxiii. *G. pityria* (Fr.) Karst.

Discussion of lectotype: Kühner states that all species of Karsten's *Galerula,* and particularly *G. pityria,* are so little known at present that it is impossible to tell whether they are *Conocybe* or *Galerina* in the sense of his concepts of these genera. Consequently he did not adopt the name *Galerula* for the group designated under the name *Galera* by Fayod but instead selected the earliest generic name which was clearly applicable to the group (the *Bryogeneae* of *Galera* [Fr.] Quél.). This was necessary because *Galera* (Fr.) Quél. is a later homonym of *Galera* Blume. *Galerula,* however, has been used as a substitute for *Galera* (Fr.) Quél. In our estimation this is the only justifiable use of the name. Since the selection of any species included in *Galerula* by Karsten would make that genus dubious, we prefer to follow Earle who indicated *G. pityria,* the most dubious of them all, as the type of the genus.

Status of generic name: Valid if used to replace *Galera* (Fr.) Quél. (which is a later homonym). This has been done by Murrill, Atkinson and R. Maire. However, if *Galerina* and *Conocybe* are both recognized, it is obvious that *Galerula* becomes a doubtful genus with little or no chance of future clarification. As such it should be rejected in favor of *Galerina* and *Conocybe.*

97. TAPINIA (Fr.) Karst. *l.c.* p. xxii. *T. panuoides* (Fr.) Karst.

Status of generic name: Valid; genus accepted by very few taxonomists.

98. ROUMEGUERIA Karst. *l.c.* p. xxiv. *R. strophosa* (Fr.) Karst.

Status of generic name: Valid; genus generally considered a synonym of *Hebeloma.* It should be noted that Karsten changed

the name to *Roumeguerites* (in 1881) and used it as a section for the atypical species of *Pholiota,* thus entirely remodeling his concept of 1879.

99. RIPARTITES Karst. *l.c.* p. xxiv. *R. tricholoma* (A. & S.) Karst.

Status of generic name: Valid; genus accepted by some authors.

100. CHITONIA (Fr.) Karst. *l.c.* p. xxv. *Agaricus poderes* Berk. & Br.

Discussion of lectotype: Since this genus is but a new status of the tribus *Chitonia* Fr. with no emendation in concept we must consider Fries' words: "Species typicae extraeuropaeae" referring to *"Agaricus podileus"* and *"Agaricus podeces"* Berkl. Fries meant *A. poderes* Berk. & Br. which is probably identical with *A. podileus* and *A. trachodes* according to Boedijn.

Status of generic name: A homonym of three earlier phanerogamic genera.

101. NAEMATOLOMA Karst. *l.c.* p. xxv. *N. sublateritium* (Fr.) Karst.

Status of generic name: Valid; genus accepted by modern taxonomists either under this name or *Hypholoma* sensu Kühner.

102. PANNUCIA Karst. *l.c.* p. xxvi. *P. noli-tangere* (Fr.) Karst.

Status of generic name: Valid; those who wish to maintain the genus *Psathyra* (which is a homonym) in a narrow sense (as in Quélet and Saccardo) should use *Pannucia* Karst. Otherwise, if the lectotype of *Pannucia* and that of *Psathyrella* are considered to be congeneric, *Pannucia* becomes a synonym of *Psathyrella.*

103. DECONICA (W. G. Smith) Karst. *l.c.* p. xxvi. *D. atrorufa* (Schaeff. ex Fr.) Karst.

Status of generic name: Valid; genus accepted by many taxonomists but by others considered a synonym of *Psilocybe.*

104. ANELLARIA Karst. *l.c.* p. xxvii. *A. separata* (L. ex Fr.) Karst.

Status of generic name: Valid; genus accepted by some authors, by others considered a section of *Panaeolus*.

105. CHALYMMOTA Karst. *l.c.* p. xxvii. *C. campanulatus* (L. ex Fr.) Karst.

Status of generic name: Synonym of *Panaeolus* (same type).

106. ONCHOPUS Karst. *l.c.* p. xxviii. *O. clavatus* (Batt. ex Fr.) Karst.

Discussion of lectotype: This species is often considered as a synonym of *Coprinus comatus*. However, by some it is considered a variety or a very closely related species.

Status of generic name: A synonym of *Coprinus*.

107. PSELLIOPHORA Karst. *l.c.* p. xxviii. *P. atramentaria* (Bull. ex Fr.) Karst.

Discussion of lectotype: Fayod restricted this genus to the above indicated species which would therefore be most desirable as the lectotype.

Status of generic name: A synonym of *Coprinus* according to all authors except Karsten and Fayod.

108. COPRINELLUS Karst. *l.c.* p. xxviii. *C. deliquescens* (Bull. ex Fr.) Karst.

Status of generic name: Valid; genus not accepted by taxonomists at present.

XVIII. Ex Karsten, Hymenomycetes Fennici. 1881.

109. LYOPHYLLUM Karst. Acta flor. faun. Fenn. *2* (1): 3. 1881. *L. leucophaeatum* Karst.

Status of generic name: Valid; genus accepted by modern taxonomists.

110. COPRINOPSIS Karst. *l.c.* p. 27. *C. Friesii* (Quél.) Karst.

Status of generic name: Valid; genus not accepted by any taxonomist.

111. ARMILLARIELLA (Karst.) Karst. *l.c.* p. 4. *A. mellea* (Fl. D. ex Fr.) Karst.

Discussion of lectotype: One of the three species included by Karsten belongs to a genus that, if accepted, has no other generic name than *Armillariella* whereas the other two are in the Fries-Saccardoan scheme as well as in the opinion of modern authors not generically different from *Pleurotus* (Fr.) Quél. sensu str. According to our principle (3), p. 245, we have proposed *A. mellea* as lectotype.

Status of generic name: Valid; genus accepted by many taxonomists at present.

XIX. Ex Spegazzini, Ann. Soc. Cient. Argent. 10–12. 1880–1881.

112. OUDEMANSIA Speg. *l.c.* **10**: 280. 1880. *O. platensis* (Speg.) Speg.

Status of generic name: A homonym of *Oudemansia* Miq. (1857).

113. OUDEMANSIELLA Speg. *l.c.* **12**: 24. 1881. *O. platensis* (Speg.) Speg.

Status of generic name: Valid unless material on which the type species was based represents a pathological condition, as Rick thought. Rick's own specimens are not deformed by a parasite, however, and agree with normal material collected in Florida. The characters described by Spegazzini are to be regarded as inexact description rather than an actual anomaly. Consequently *Oudemansiella* is here regarded as a valid genus.

XX. Ex Berkeley & Broome, Ann. Mag. Nat. Hist. V. 12. 1883.

114. LACCARIA Berk. & Br. *l.c.* p. 370. *L. laccata* (Scop. ex Fr.) Berk. & Br.

Status of generic name: Valid; genus accepted almost unanimously by taxonomists.

XXI. Ex Bresadola, Schulzeria. 1886.

115. SCHULZERIA Bres. *l.c.* p. 7. *S. rimulosa* Schulz. & Bres.

Status of generic name: Valid.

XXII. Ex Quélet, Enchiridion Fungorum. 1886.

116. GYROPHILA Quél. *l.c.* p. 9. *G. equestris* (L. ex Fr.) Quél.

Status of generic name: Synonym of *Tricholoma* (same type), if the latter genus is conserved (as appears to be desirable); if *Tricholoma* is not conserved, *Gyrophila* becomes a synonym of *Cortinellus* unless the lectotypes of both genera are considered not to be congeneric, in which case *Gyrophila* would be valid.

117. OMPHALIA Quél. *l.c.* p. 19. *O. infundibuliformis* (Schaeff. ex Fr.) Quél.

Status of generic name: A homonym of *Omphalia* (Pers.) ex Gray, and at the same time a synonym of *Clitocybe* (Fr.) Quél. (same type).

118. OMPHALINA Quél. *l.c.* p. 42. *O. umbellifera* (L. ex Fr.) Quél.

Discussion of lectotype: When selecting the lectotype we had to discard the species belonging to such sections as have recently been transferred to *Clitocybe* (species such as *O. hydrogramma, O. ventosa, O. epichysium, O. rustica, O. xanthophylla, O. griseopallida*) and species transferred to other genera (*O. maura, O. scyphoides, O. fibula, O. gracilis, O. integrella*, etc.). When all these are excluded there remains, in addition to some dubious species, the group including *O. umbellifera* and *O. philonotis* which forms *Omphalia* (Fr.) Quél. sensu str. Singer. It is technically necessary under the rules to adopt the name *Omphalina* (instead of *Omphalia*) for this group and whatever groups the various authors will choose to combine with it. The change in the name is so slight that we do not feel justified in asking that the genus *Omphalia* (Fr.) Quél. be conserved against *Omphalia* (Pers.) Gray and *Omphalina* Quél. The change to *Omphalina* cannot be regarded as inconvenient because the necessary combinations have

nearly all been made, and in either case the genus and most of the transfers are credited to Quélet.

Status of generic name: Valid; genus accepted by most taxonomists (usually as *Omphalia* and in a broad rather than a restricted sense).

119. CALATHINUS Quél. *l.c.* p. 46. *C. hypnophilus* (Berk.) Quél.

Status of generic name: A homonym of *Calathinus* Rafin. (1836).

120. RHODOPHYLLUS Quél. *l.c.* p. 57. *R. lividus* (Bull. ex Fr.) Quél.

Discussion of lectotype: Since none of the species included in *Rhodophyllus* by Quélet would, if adopted as lectotype, serve to maintain this genus against the earlier smaller genera (*Nolanea, Leptonia, Eccilia*), we are content to choose the most conspicuous species of the subgenus *Entoloma* (Fr.) Quél.

Status of generic name: A synonym of *Entoloma* (same type). However, *Rhodophyllus* is proposed by us for conservation against *Entoloma* if used in the sense of Quélet (including the majority of the species of *Nolanea, Leptonia* and *Eccilia*).

121. DRYOPHILA Quél. *l.c.* p. 66. *D. squarrosa* (Muell. ex Fr.) Quél.

Discussion of lectotype: Whatever type be selected, *Dryophila* would either become a synonym of *Rozites, Pholiota, Flammula* or *Gymnopilus* or would replace one of the modern names such as *Agrocybe, Pholiotina, Phaeomarasmius* or *Galerina*. The choice of *D. squarrosa* takes into account merely the fact that it is the best known and most widely distributed species of the whole group.

Status of generic name: A synonym of *Pholiota* (same type).

122. HYLOPHILA Quél. *l.c.* p. 98. *H. fastibilis* (Fr.) Quél.

Discussion of lectotype: As in the foregoing genus we can at present see no advantage (according to our principle (4), p. 245) in attempting to establish this genus on any other lectotype than

H. fastibilis. Whatever lectotype is chosen, *Hylophila* either becomes a synonym of *Hebeloma, Naucoria, Flammula, Deconica* or *Tubaria*, or replaces one of the modern genera (which would be undesirable) such as *Agrocybe, Phaeomarasmius, Alnicola, Galerina, Phaeocollybia* or *Macrocystidia*.

123. PLUTEOLUS Quél. *l.c.* p. 104. *P. reticulatus* (Fr.) Gill.

Status of generic name: Homonym and synonym of *Pluteolus* (Fr.) Gill.

124. PRATELLA Quél. *l.c.* p. 109. *P. campestris* (L. ex Fr.) Gray.

Status of generic name: Homonym and synonym of *Pratella* (Pers.) ex Gray and consequently a synonym of *Agaricus* L. ex Fr. sensu Karst. (same type).

125. GEOPHILA Quél. *l.c.* p. 111. *G. aeruginosa* (Curt. ex Fr.) Quél.

Discussion of lectotype: The situation is analogous to that discussed under nos. 121–122.

Status of generic name: Synonym of *Stropharia* (same type).

126. DROSOPHILA Quél. *l.c.* p. 118. *D. Candolleana* (Fr.) Quél.

Status of generic name: Synonym of *Hypholoma* (same type), and in the opinion of many authors congeneric with type of *Psathyrella*.

127. COPRINARIUS Quél. *l.c.* p. 118. *C. campanulatus* (L. ex Fr.) Quél.

Status of generic name: Synonym of *Panaeolus* (same type).

128. DICTYOLUS Quél. *l.c.* p. 139. *D. retirugis* (Bull. ex Fr.) Quél.

Status of generic name: Synonym of *Leptotus* Karst. (same type).

129. PLEUROTUS Quél. *l.c.* p. 147. *P. ostreatus* (Jacq. ex Fr.) Quél.

Status of generic name: Homonym and synonym of *Pleurotus* (Fr.) Quél. (same type).

XXIII. Ex Patouillard, Hyménomycètes d'Europe. 1887.

130. MUCIDULA Pat. *l.c.* p. 95. *M. mucida* (Schrad. ex Fr.) Pat.

Status of generic name: Valid; genus accepted by many modern taxonomists, by others considered congeneric with type of *Oudemansiella* which has priority.

131. MELALEUCA Pat. *l.c.* p. 96. *M. vulgaris* Pat.

Status of generic name: Homonym of *Melaleuca* L. (1767).

132. ANDROSACEUS Pat. *l.c.* p. 105. *A. rotula* (L. ex Fr.) Pat.

Status of generic name: Synonym of *Marasmius* (same type).

133. DOCHMIOPUS Pat. *l.c.* p. 113. *D. variabilis* (Pers. ex Fr.) Pat.

Status of generic name: Valid; genus accepted by some modern taxonomists.

134. LACRYMARIA Pat. *l.c.* p. 122. *L. velutina* (Pers. ex Fr.) Pat.

Status of generic name: Valid; genus accepted by many modern taxonomists.

135. GEOPETALUM Pat. *l.c.* p. 127. *G. petaloides* (Bull. ex Fr.) Pat.

Status of generic name: Valid; genus accepted by many modern taxonomists (under the name of *Acanthocystis*).

136. NEUROPHYLLUM Pat. *l.c.* p. 129. *N. clavatum* (Pers. ex Fr.) Pat.

Status of generic name: Synonym of *Gomphus* (same type).

XXIV. Ex Quélet, Flore Mycologique de France. 1888.

137. PHYLLOPORUS Quél. *l.c.* p. 409. *P. Pelletieri* (Lév.) Quél.

Status of generic name: Valid; genus accepted by most taxonomists.

XXV. Ex Patouillard, Bull. Soc. Myc. France. 1888.

138. LEU(CO)COPRINUS Pat. Bull. Soc. Myc. Fr. **4**: 26. 1888. *L. flavipes* Pat.

Status of generic name: Valid; but type species considered to be congeneric with either *Hiatula* or *Lepiota* by many taxonomists.

XXVI. Ex Schroeter, in Cohn, Kryptogamen-Flora von Schlesien, Pilze. 1885–1889.

139. LIMACIUM (Fr.) Schroet. *l.c.* p. 530. *L. eburneum* (Bull. ex Fr.) Schroet.

Status of generic name: A synonym of *Hygrophorus* (same type).

140. LACTARIA Pers. ex Schroet. *l.c.* p. 534. *L. deliciosa* (L. ex Fr.) Schroet.

Status of generic name: A synonym of *Lactarius* (same type).

141. LACTARIELLA Schroet. *l.c.* p. 544. *L. lignyota* (Fr.) Schroet.

Status of generic name: Valid; but genus not accepted by taxonomists (the type considered congeneric with type of *Lactarius*).

142. RUSSULINA Schroet. *l.c.* p. 550. *R. lutea* (Huds. ex Fr.) Schroet.

Status of generic name: Synonym of *Russula* (same type).

143. CORTINIOPSIS Schroet. *l.c.* p. 566. *C. lacrimabundus* (Bull. ex Fr.) Schroet.

Discussion of lectotype: This species is the same as *Agaricus velutinus* Pers. ex Fr.

Status of generic name: A synonym of *Lacrymaria* (same type).

144. ASTROSPORINA Schroet. *l.c.* p. 576. *A. praetervisa* Quél.

Status of generic name: A synonym of *Clypeus* (Britz.) Fay. (same type) unless the latter was published (a few weeks) later; in which case *Astrosporina* would be a valid genus though not accepted as different from *Inocybe* by most authors at present.

145. HYPORHODIUS (Fr.) Schroet. *l.c.* p. 613. *H. lividus* (Bull. ex Fr.) Schroet.

Status of generic name: Synonym of *Rhodophyllus* Quél. and *Entoloma* (Fr.) Quél. (same type).

146. RHODOSPORUS Schroet. *l.c.* p. 617. *R. cervinus* (Schaeff. ex Fr.) Schroet.

Status of generic name: Synonym of *Pluteus* Fr. (same type).

147. RUSSULIOPSIS Schroet. *l.c.* p. 622. *R. laccata* (Scop. ex Fr.) Schroet.

Status of generic name: Synonym of *Laccaria* Berk. & Br. (same type).

XXVII. Ex Karsten, Basidsvampar. 1889.

148. ONCOPUS Karst. *l.c.* p. 256. *O. clavatus* (Batt. ex Fr.) Karst.

Status of generic name: Merely another spelling of *Onchopus* Karst. 1879.

XXVIII. Ex Patouillard, Journal de Botanique 3. 1889.

149. CRINIPELLIS Pat. *l.c.* p. 336. *C. stipitaria* (Fr.) Pat.

Status of generic name: Valid; genus accepted by many taxonomists.

XXIX. Ex Patouillard, Bull. Soc. Myc. France 5. 1889.

150. CYMATELLA Pat. *l.c.* p. 193. *C. marasmioides* (B. & C.) Pat.

Status of generic name: Valid; genus accepted by some taxonomists.

XXX. Ex Fayod, Prodrome d'une Histoire Naturelle des Agaricinés. 1889.

151. DELICATULA Fay. Ann. Sc. Nat. VII. 9: 313. 1889. *Omphalia integrella* (Pers. ex Fr.) Quél.

Status of generic name: Valid; genus accepted by modern taxonomists.

152. LENTINELLUS Fay. *l.c.* p. 336. *Lentinus cochleatus* (Pers. ex Fr.) Quél.

Status of generic name: Homonym and synonym of *Lentinellus* Karsten (same type).

153. OMPHALOTUS Fay. *l.c.* p. 338. *Pleurotus olearius* (D.C.) Gill.

Status of generic name: Valid; genus not accepted by most taxonomists.

154. UROSPORA Fay. *l.c.* p. 338. *Pleurotus mitis* (Pers. ex Fr.) Quél.

Discussion of lectotype: *P. mitis* is the only species included by Fayod that is well enough studied at present to comply with our principle (4), p. 245.

Status of generic name: Valid; genus not accepted by taxonomists.

155. PLEUROTELLUS Fay. *l.c.* p. 339. *Pleurotus hypnophilus* (Berk.) Quél. sensu Fay.

Status of generic name: Valid; genus accepted by many taxonomists either under this name or *Calathinus*.

156. CYSTODERMA Fay. *l.c.* p. 351. *Lepiota amianthina* (Scop. ex Fr.) Karst.

Status of generic name: Valid; genus accepted by many taxonomists, by some considered congeneric with *Lepiota* or *Armillaria*.

157. FUSISPORA Fay. *l.c.* p. 351. *Lepiota sistrata* (Fr.) Quél.

Status of generic name: Valid but not likely to be taken up since the present interpretation of *L. sistrata* does not bear out

Fayod's statements and is hardly generically different from *Lepiota* sensu str.

158. FLAMMOPSIS Fay. *l.c.* p. 356. *F. lubrica* (Fr.) Fay.

Status of generic name: Valid and will replace *Flammula* (Fr.) Quél. if the latter is not conserved. The lectotypes of *Flammopsis* and *Flammula* are considered to be congeneric.

159. CONOCYBE Fay. *l.c.* p. 357. *Galera tenera* (Schaeff. ex Fr.) Quél.

Status of generic name: Valid; genus accepted by many taxonomists.

160. AGROCYBE Fay. *l.c.* p. 358. *Pholiota praecox* (Pers. ex Fr.) Quél.

Discussion of lectotype: This species was designated as the type by Fayod himself (though erroneously as *Naucoria praecox*). It should be kept in mind that it is a veiled species with pleurocystidia.

Status of generic name: Valid; genus accepted by many taxonomists.

161. PHOLIOTINA Fay. *l.c.* p. 359. *Pholiota blattaria* (Fr.) Gill.

Status of generic name: Valid; genus accepted by some modern taxonomists.

162. RYSSOSPORA Fay. *l.c.* p. 361. *Flammula apicrea* (Fr.) Gill.

Discussion of lectotype: It is not entirely clear just what Fayod intended to include in this genus. *Flammula apicrea* does not appear to be accepted by all authors in the same sense, but Bulliard's plate, cited by Fries, certainly represents either *Gymnopilus* or *Flammula*. Both these genera have priority over *Ryssospora*. Even if *Flammula* is not conserved, *Flammopsis* would obviously be preferred. Konrad and Maublanc think that *F. apicrea* (Fr.) Gillet is merely a mild form of *F. alnicola*. If this is true, as it may well be, it is evident that Fayod did not intend to include it in his genus since he described the spores as rough. Another spe-

cies included by Fayod is "*Flammula marginata* Batsch" (should read *Pholiota marginata* (Batsch ex Fr.) Quél.). This is now often called *Galerina marginata* (Batsch ex Fr.) Kühner. In this case Fayod may actually have studied the true *G. marginata*, but its characters are not in good agreement with the diagnosis of *Ryssospora* as given by Fayod. *Pholiota mustelina*, also cited by Fayod, was not well known to him since he added "(cuticule nulle?)." The last species indicated by Fayod, *Naucoria hilaris*, is now considered as either *Naucoria* sensu lato (in which case there would be no need of a new generic name) or a *Phaeocollybia*. However, the latter name should not be dropped in favor of *Ryssospora* because the description of *Agaricus hilaris* by Fries and others does not fit in Fayod's diagnosis of *Ryssospora*. Thus only *F. apicrea* can be logically proposed as lectotype.

Status of generic name: Valid, but a synonym of either *Gymnopilus* or *Flammula*, very likely the former but possibly the latter if *F. apicrea* is really a mild *F. alnicola*.

163. MYXOCYBE Fay. *l.c.* p. 361. *Pholiota radicosa* (Bull. ex Fr.) Quél.

Status of generic name: Valid; genus not accepted by other taxonomists.

164. CLYPEUS (Britz.) Fay. *l.c.* p. 562. *Inocybe praetervisa* Quél.

Status of generic name: We are unable to establish the exact date of Fayod's publication in 1889; consequently it may be that this is a later synonym of *Astrosporina* Schroet. (1889). Neither name has found much acceptance among taxonomists. Heim, Kühner, Kauffman, Ricken and Lange, the most distinguished specialists in this group, have not distinguished it generically from *Inocybe*.

165. SCHINZINIA Fay. *l.c.* p. 365. *S. pustulata* Fay.

Status of generic name: Valid, but the species has not been collected since and the genus has never been clarified further.

166. CYPHELLOPUS Fay. *l.c.* p. 365. *Agaricus acetabulosus* Sow.

Status of generic name: Fayod stated that Berkeley established the genus *Acetabularia* on this same type, but actually Berkeley described it as a subgenus, and this was raised to generic status by Saccardo in 1887. As such it is a homonym of *Acetabularia* Lamour., an algal genus. *Cyphellopus* Fay., therefore, is a new name for *Acetabularia* (Berk.) Sacc., a genus containing one species and that one so poorly known that the genus must be considered of doubtful standing.

167. DERMOCYBE (Fr.) Fay. *l.c.* p. 372. *D. cinnamomea* (L. ex Fr.) Fay.

Status of generic name: Valid, but type considered congeneric with that of *Cortinarius* by most authors.

168. HYDROCYBE (Fr.) Fay. *l.c.* p. 372. *H. decipiens* (Pers. ex Fr.) Fay.

Status of generic name: A homonym of *Hydrocybe* Karst. (a misspelling of *Hygrocybe*) and besides considered congeneric with *Cortinarius* by most authors.

169. TELAMONIA (Fr.) Fay. *l.c.* p. 373. *T. torva* (Fr.) Fay.

Status of generic name: Same as for *Dermocybe.*

170. SPHAEROTRACHYS Fay. *l.c.* p. 374. *"Myxacium" liquidum* Fr.

Status of generic name: Same as for *Dermocybe.*

171. MYXACIUM (Fr.) Fay. *l.c.* p. 374. *Myxacium collinitum* (Pers. ex Fr.) Fay.

Status of generic name: Same as for *Dermocybe.*

172. PHLEGMACIUM (Fr.) Fay. *l.c.* p. 375. *P. decoloratum* (Fr.) Fay.

Status of generic name: Same as for *Dermocybe.*

173. ATYLOSPORA Fay. *l.c.* p. 376. *Psathyra corrugis* (Fr.) Quél.

Status of generic name: Valid, but not accepted by any taxonomist other than Murrill. The main character on which the genus is based (sessile basidiospores) appears to have been due to faulty observation and the lectotype is generally considered congeneric with that of *Psathyra* (Fr.) Quél. (which is a later homonym). It is also considered congeneric with the lectotype of *Psathyrella* by many authors, and the latter name has priority.

174. PLUTEOPSIS Fay. *l.c.* p. 377. *"Agaricus phellospermus* Secret." [9]

Status of generic name: Valid, but not accepted by taxonomists. It is apparently identical with *Psathyrella* (Fr.) Quél.

175. PSILOCYBE Fay. *l.c.* p. 377. *"Psilocybe foeni-sicci* Pers." [10]

Discussion of lectotype: The only species of those indicated by Fayod that fits the original diagnosis is *A. foenisecii.*

Status of generic name: A homonym of *Psilocybe* (Fr.) Quél.

176. GLYPTOSPORA Fay. *l.c.* p. 377. *Agaricus velutinus* Pers. ex Fr.

Status of generic name: Synonym of *Lacrymaria* Pat. (same type).

177. LENTISPORA Fay. *l.c.* p. 379. *Coprinus tomentosus* (Bull. ex Fr.) Fr.

Status of generic name: Valid, but genus not accepted by taxonomists at present.

178. EPHEMEROCYBE Fay. *l.c.* p. 380. *Coprinus ephemerus* (Bull. ex Fr.) Fr.

Status of generic name: Same as for no. 177.

[9] *Agaricus pellospermus* Secr. is meant.
[10] *Agaricus foenisecii* Pers. ex Fr. is meant.

179. GYMNOGOMPHUS Fay. *l.c.* p. 385.

Status of generic name: Hyponym (the description is not distinctive enough to exclude *Gomphidius*, and no species belonging here was indicated).

180. HEXAJUGA Fay. *l.c.* p. 389. *Clitopilus prunulus* (Scop. ex Fr.) Quél.

Status of generic name: Synonym of *Clitopilus* (same type).

181. OCTOJUGA Fay. *l.c.* p. 390. *Claudopus variabilis* var. Karst. Myc. Fenn. p. 112.

Status of generic name: Valid; genus accepted by some modern taxonomists; by others not separated from *Clitopilus*.

XXXI. Ex O. Kuntze, Revisio Generum Plantarum. 1891–1898.

182. GOMPHOS Kuntze, *l.c.* 2: 853. 1891. *Cortinarius castaneus* (Bull. ex Fr.) Fr.

Status of generic name: A homonym of *Gomphus* (Pers.) ex Gray (1821).

183. MASTOLEUCOMYCES Batt. ex Kuntze, *l.c.* 2: 860. 1891. *Mastoleucomyces ramentaceus* (Bull. ex Fr.) Kuntze.

Status of generic name: Valid, but genus not accepted by taxonomists.

184. ORCELLA Batt. ex Kuntze, *l.c.* 2: 863. 1891. *Orcella obesa* (Batsch) ex Kuntze.

Status of generic name: Since *O. obesa* is generally considered a synonym of *Clitopilus prunulus, Orcella* is a synonym of *Clitopilus*.

185. POCILLARIA P. Browne ex Kuntze, *l.c.* 2: 865. 1891. *Pocillaria crinita* (L. ex Fr.) Kuntze.

Status of generic name: Valid, but type considered to be congeneric with lectotype of *Lentinus* by all taxonomists at present.

186. PSEUDOFARINACEUS Kuntze, *l.c.* **2**: 867. 1891. *Pseudofarinaceus vaginatus* (Bull. ex Fr.) Kuntze.

Status of generic name: Synonym of *Vaginata* Gray (same type).

187. MASTOCEPHALUS Batt. ex Kuntze, *l.c.* **2**: 859. 1891. *Mastocephalus cepaestipes* (Bolt. ex Fr.) Kuntze.

Status of generic name: Valid, but genus congeneric with *Leucocoprinus* Pat. and perhaps with *Lepiota* or *Hiatula*.

188. LATZINAEA Kuntze, *l.c.* **2**: 857. 1891. *L. pascua* (L. ex Fr.) Kuntze.

Status of generic name: Synonym of *Nolanea* (Fr.) Quél. (which is not a homonym as Kuntze thought). Both are based on the same type.

189. LACTIFLUUS (Fr.) Kuntze, *l.c.* **2**: 856. 1891. *L. deliciosus* (L. ex Fr.) Kuntze.

Status of generic name: Synonym of *Lactarius* Gray (same type).

190. CLARKEINDA Kuntze, *l.c.* **2**: 848. 1891. *C. poderes* (Berk. & Br.) Kuntze.

Status of generic name: Valid.

191. CHAMAECERAS Reb. ex Kuntze, *l.c.* **3**^{2}: 454. 1898. *Chamaeceras androsaceus* (L. ex Fr.) Kuntze.

Status of generic name: Valid, but type of genus considered congeneric with the type of *Marasmius* by practically all authors at present.

192. DENDROSARCUS Paul. ex Kuntze, *l.c.* **3**^{2}: 462. 1898. *D. nigrescens* Paul. ex Kuntze.

Status of generic name: Synonym of *Pleurotus* and *Crepidopus*, and so intended by Kuntze. *D. nigrescens* Paulet is *Pleurotus ostreatus* (Jacq. ex Fr.) Quél.

XXXII. Ex Patouillard, Plantes . . . Tunisie. 1897 and Essai taxonomique. 1900.

193. MELANOLEUCA Pat. Cat. rais. Pl. Cell. Tun. p. 22. 1897. *M. vulgaris* Pat.

Discussion of lectotype: *Melanoleuca* is merely a new name for *Melaleuca,* so the lectotype of the latter must be retained.

Status of generic name: Valid; genus accepted by many modern taxonomists (and used by Murrill in a broader sense to replace *Tricholoma*).

194. DICTYOPANUS Pat. Essai, p. 137. 1900. *Polyporus rhipidium* Berk.

Status of generic name: Valid; genus accepted by some taxonomists.

195. HYMENOGLOEA Pat. Essai, p. 146. 1900. *H. Riofrioi* (Pat.) Pat.

Status of generic name: Valid; genus accepted by some taxonomists.

196. MELANOTUS Pat. Essai, p. 175. 1900. *M. bambusinus* Pat.

Status of generic name: Valid; genus accepted by some taxonomists.

XXXIII. Ex Eichelbaum, Pilzflora Ostusambarageb. 1906.

197. AGARICOCHAETE Eich. Verh. Naturw. Ver. Hamburg 3. **XIV**: 58. 1906. *A. mirabilis* Eich.

Status of generic name: Valid; genus not found since described.

XXXIV. Ex Ricken, Die Blätterpilze, 1910–1915.

198. INOLOMA (Fr.) Ricken, *l.c.* p. 149. 1912. *I. violaceus* (L. ex Fr.) Ricken.

Status of generic name: Synonym of *Cortinarius* (same type).

DISCUSSION OF THE NOMINA GENERICA CONSERVANDA PROPOSED BY R. MAIRE (1935)

DICTYOLUS Quél. (1886) against *Leptoglossum* Karst. (1879).

Since the generic name *Leptotus* Karst. (1879) is also available and is certainly not homonymous (whereas *Leptoglossum* might be so considered), we do not believe that *Dictyolus* Quél. deserves to be conserved. The species concerned are so rare that none of the names involved has been established by usage.

AGARICUS L. ex Fr. (1821) em. Karst. against *Psalliota* (Fr.) Quél. and *Pratella* Gray.

If the type we have proposed (no. 1) is adopted—and we cannot see which other species of *Agaricus* could be chosen and still be historically logical—the genus *Agaricus* in the sense of Karsten and Saccardo does not need conservation. On the contrary, if anyone would prefer *Psalliota* or *Pratella*, he would need to obtain the sanction of the International Congress for his choice.

FLAMMULA (Fr.) Quél. (1872) against *Ryssospora* Fay. (1889), *Gymnopilus* Karst. (1879) and *Visculus* Earle (1909).

The conservation of *Flammula* (Fr.) Quél. appears to be very desirable from the point of view of some mycologists. However, as far as we can see, it depends on agreement with the phanerogamic commission whether the name *Flammula* D. C. is considered definitely out of use. This appears to be the attitude of Maire and the Nomenclature Commission of the British Mycological Society. On the condition that such an agreement can be made, we join the others in proposing that *Flammula* (Fr.) Quél. be conserved against the genera indicated by Maire and also against *Gymnocybe* Karst. (1879) and *Flammopsis* Fay. (1889).

GALERA (Fr.) Quél. (1872) against *Conocybe* Fay. (1889).

Since Kühner, in the most extensive monograph of the groups involved, has chosen and defined the genera *Conocybe* and *Galerina*, we cannot see any advantage in maintaining the old

generic name *Galera* which is ambiguous in the light of modern taxonomy. The name *Galerula* Karsten is available to all who wish to use the genus in the concept of Quélet and Saccardo, and the combinations of any consequence have already been made. Since there is no real need to conserve *Galera* (Fr.) Quél., we do not believe it advisable to act on the assumption that *Galera* Blume (1825) is unlikely to be taken up again by phanerogamic botanists. If *Galera* (Fr.) Quél. were conserved, the question of a lectotype for it would be very delicate. From an historical point of view, and in line with the procedure outlined in the present Rules, it should be a species included by Fayod in his emendation, which was the first emendation of the genus along the lines we now accept. If this is kept in mind, *Galera* (Fr.) Quél. must be retained for the species now placed in *Galerina* Earle by Kühner, Singer and others. Consequently, the lectotype, *G. tenera* (which is a *Conocybe*), proposed by R. Maire and Wakefield, is untenable. If *Galera* (Fr.) Quél. is not conserved, it is automatically not valid and the question of selecting a lectotype for it is of no importance.

PANUS Fr. (1836) against *Rhipidium* Wallr. (1833).

Notwithstanding the fact that this proposal originated from an error, we feel that it is necessary to support it because of other reasons. *Rhipidium* is by no means a *Panus* or *Panellus* but instead a *Schizophyllum* (*Rhipidium stypticum Wallr.* = *Schizophyllum commune* Fr.). Therefore *Panus* does not need to be conserved against it. If our scheme of type species is accepted, however, the genus *Panus* is in need of conservation against *Pleuropus* (Pers.) ex Gray. Failure to do this would require that all species be transferred. Some are very important, almost cosmopolitan, of economic significance and consequently well known in the literature of fields other than taxonomic mycology. In addition, the names *Pleuropus* and *Pleurotus* together in the same family of the Agaricales would cause errors and misunderstanding. Since a selection of any other lectotype for *Pleuropus* would merely mean proposing some other well known name for conservation (see no. 9 of our list) the situation could not be resolved in that way. Consequently we consider it vitally im-

portant that the genus *Panus* Fr. be conserved against *Pleuropus* (Pers.) ex Gray.

TRICHOLOMA (Fr.) Quél. (1872) against *Cortinellus* Roze (1876), *Gyrophila* Quél. (1886) and *Monomyces* Earle (1909).

We agree that conservation of this genus would be very beneficial for the continuity of mycological nomenclature, and we support it wholeheartedly.

VOLVARIA (Fr.) Quél. (1872) against *Pseudofarinaceus* Earle non Kuntze 1909.

If *Volvaria* should be conserved at all, it should be conserved against *Volvariopsis* Murrill (1911). Though *Pseudofarinaceus* Earle non Kuntze is claimed to be the correct determination of Battara's "genus," it is important that the first mention of this pre-Friesian name after 1821 was made by Kuntze, and therefore it has to be adopted in Kuntze's sense. However, *Pseudofarinaceus* Kuntze non Earle is not a *Volvaria* (see no. 186 of our lectotypes). This makes Earle's *Pseudofarinaceus* a homonym. Since Murrill has made most of the important transfers to *Volvariopsis*, we are not convinced that the conservation of *Volvaria* is really vital though it may be desirable for sentimental reasons.

PAXILLUS Fr. (1836) against *Rhymovis* Pers. (1825) and *Ruthea* Opat. (1836).

Rhymoxis Pers. was only conditionally proposed by Persoon and is not a validly published name. But *Ruthea* Opat. may (or may not) have priority over *Paxillus* and therefore, in order to maintain continuity and avoid transfers, we should conserve *Paxillus* Fr. If between now and the time for a decision on this proposal it can be established that *Paxillus* Fr. has priority over *Ruthea*,[11] it would, of course, not be necessary to conserve *Paxillus*.

[11] Both *Paxillus* and *Ruthea* were proposed in dissertations for the doctor's degree early in 1836, and *Ruthea* was contained in the paper that was accepted by the University earlier than the paper containing *Paxillus*. But according to Art. 36 of the Rules only the actual date of the publication is decisive, and we have not been able to establish this exactly.

NOMINA GENERICA CONSERVANDA PROPOSITA

In addition to those genera proposed by R. Maire whose approval we have indicated above, we believe it is necessary to propose the following generic names for conservation:

CORTINARIUS Fr. (1836) against *Cortinaria* Gray (1821).

Cortinarius is now almost unanimously used. According to Art. 70, 3 of the International Rules, *Cortinarius* is not merely an orthographic variant of *Cortinaria;* therefore all the species not indicated in Gray would have to be transferred to it (excepting those mentioned under *Cortinaria* by Murrill). This would cause innumerable new combinations.

PLEUROTUS (Fr.) Quél. (1872) against *Crepidopus* (Pers.) ex Gray (1821).

The name *Crepidopus* would replace *Pleurotus* for such species as *P. ostreatus, P. Eryngii, P. dryinus* and other important economic species. This would not only necessitate new combinations for fungi well known to the general public as well as mycologists but would introduce a perpetual source of confusion in generic names, i.e. *Crepidopus* and *Crepidotus.* This is already evident in the literature. Earle took up Gray's *Crepidopus* but spelled it (wrongly) *Crepidotus.*

The following two genera are proposed to be conserved conditionally. This seems to be quite an innovation at first glance, but it actually is not foreign to the rules, since we do not believe that the conservation of a certain genus *in a certain sense only* should be illegal. Since the proposals made here will stabilize existing nomenclature they are in line with the principles on which the rules have been formulated and if technicalities against such proposals are found they should be removed. Such conservation as this is necessary in the two cases proposed in order to achieve an acceptable compromise between the conservative and the modern school of taxonomists who cannot agree on a single solution (in each case) that is satisfactory to both. In one case a genus is proposed to be conserved for the benefit of the conservative taxon-

omists (*Marasmius*) and in the other for the benefit of those adhering to modern taxonomy (*Rhodophyllus*).

1. MARASMIUS Fr. (1836) sensu lato, against *Micromphale* Gray (1821).

Reasons: The section *Gloeonemi* Kühner of the genus *Marasmius* contains the proposed type species of Gray's genus *Micromphale*. Some modern authors consider this section a genus. For these authors the name *Micromphale* is welcome and does not interfere with the use of the name *Marasmius* in a more restricted sense. However, in the Friesian sense *Micromphale*, as a name for *Marasmius*, has priority and would have to be substituted unless the latter is conserved. The substitution of *Micromphale* for *Marasmius* would involve hundreds of transfers besides doing away with one of the most widely used generic names in the gill fungi. Consequently it is highly desirable to conserve *Marasmius*.

Since the modern authors who recognize Kühner's section *Gloeonemi* as a genus must abandon the name which they originally used (*Heliomyces*) a new name will have to be given if *Micromphale* is not left available to them. If *Marasmius* is conserved against *Micromphale* as proposed here both groups of taxonomists will enjoy a maximum of continuity.

2. RHODOPHYLLUS Quél. (1886) sensu lato against *Entoloma* (Fr.) Quél., *Leptonia* (Fr.) Quél. (1872), *Nolanea* (Fr.) Quél. (1872), *Eccilia* (Fr.) Quél. (1872), and *Claudopus* (Fr.) Gill. (1876).

Reasons: The reasons that make it desirable to conserve *Rhodophyllus* Quélet against the above mentioned Friesian-Saccardoan genera have been enumerated in R. Singer, *Farlowia* **2**: 50–51. 1945. Here also we propose that the genus be conserved in the original sense, i.e. to include all the Rhodogoniosporaceae known to Quélet. This is the way it was used by Quélet, and this usage has been followed by all the modern authors who have taken up the name. This proposed action is desirable in order to avoid the possibility of endless name juggling in the future by those who might want to insist that one of the genera proposed by Quélet in 1872 be used in place of *Rhodophyllus*. It is true that Quélet

should not have used a new name in 1886 but in the meantime it has become established in the literature and in our estimation nothing would be gained by abandoning it for purely legal reasons. If conserved with the above understanding *Rhodophyllus* can be discarded by those who still maintain that *Entoloma, Nolanea, Leptonia, Eccilia* and *Claudopus* are separate genera, and the earlier generic names of Quélet can be neglected by those who follow Quélet, Lange and Romagnesi in considering them all congeneric.

CONCLUSIONS

Since we consider the adoption of the *Species Lectotypicae Propositae* for the agarics as the most urgent need in clarifying the nomenclature of the gill fungi, the list published in this article is respectfully submitted for the consideration of mycologists in general and the next International Botanical Congress in particular.

The list of *Nomina Generica Conservanda Proposita* by R. Maire has been critically discussed, and only four out of eight genera usually considered as gill fungi (agarics), namely *Flammula, Panus, Tricholoma* and *Paxillus,* are, in our opinion, worth or in need of conservation. *Volvaria* should be either conserved against *Volvariopsis* or abandoned in favor of it (no definite stand is taken by us as long as the agreement with the lichenological commission has not been reached). In addition, we propose the adoption of four other genera not mentioned in Maire's list, namely *Cortinarius, Pleurotus, Marasmius* (sensu originali), and *Rhodophyllus* (sensu originali).

We propose the rejection of the proposal to consider the Friesian subgenera and tribes as genera.

The above proposals will be submitted to the Executive Committee of the next International Botanical Congress on Nomenclature either in the form adopted in the present paper, or (if improvements are suggested by other mycologists) in an emended form. Our proposals are at the same time intended to be studied and discussed by the permanent groups of the Special Committee for Mycological Nomenclature. We believe that the publication of these proposals at the present date will help to speed up the procedure, giving all mycologists interested in and concerned with

these problems ample time to check on our proposals, and either improve them, or adopt them and eventually vote on them.

FARLOW HERBARIUM,
HARVARD UNIVERSITY,
CAMBRIDGE, MASS.
DEPARTMENT OF BOTANY AND UNIVERSITY HERBARIUM,
UNIVERSITY OF MICHIGAN,
ANN ARBOR, MICH.

INDEX

The index is to the genera represented in the list of lectotypes and those proposed for conservation or rejection. The figures after the generic names in this index are the numbers under which the names appear in our list. If the genus is also mentioned in the last two chapters dealing with the genera conservanda, the letter "C" is added for nomina conservanda and "(C)" for rejected genera.

SYNCHYTRIUM DECIPIENS AND SYNCHYTRIUM CHRYSOSPLENII

MELVILLE T. COOK

(WITH 3 FIGURES)

The material for the study of *Synchytrium decipiens* was collected in the gorges of the campus of Cornell University. The material for the study of *Synchytrium Chrysosplenii* was given to the writer by Dr. H. M. Fitzpatrick, Mycologist at Cornell University. According to the available data the host plant was *Chrysosplenium americanum* and it was collected at Labrador Lake near Ithaca, New York.

SYNCHYTRIUM DECIPIENS (Peck) Farlow

The records indicate that this is the most widely distributed species of *Synchytrium* in America. It has been reported from Connecticut, Kansas, Massachusetts, New Jersey, New York, New Hampshire, Vermont, Pennsylvania, Maryland, North Carolina, Ohio, Indiana, Wisconsin, North Dakota, Michigan, Minnesota, Iowa, Missouri, Nebraska and Canada. It is well known as a parasite on *Amphicarpa monoica* (L.) Ell. (*Falcata comosa* Am. auth., *Glycine comosa* L.),[1] a host plant with very thin leaves and large intercellular spaces in the mesophyll.

The galls are small, numerous, on both surfaces of the leaves and on petioles and stems, yellow and usually surrounded by a well defined halo (FIG. 1, *A* & *B*). When the fungus is mature, the galls rupture and release the sporangia as a powder on the surfaces of the leaves. The galls are extremely variable in size and shape, depending on the location on the plant and on the age of the tissues at time of infection. Compound galls, i.e., one gall on another, are rare.

The infections are always in young, epidermal cells. They occur on both surfaces of the leaves and are most numerous in the vicinity

[1] It has been reported on *F. pitcheri* and *F. japonica* in Japan, on *Vigna vexillata* in Costa Rica and on *Psoralea mutisii* in Ecuador.

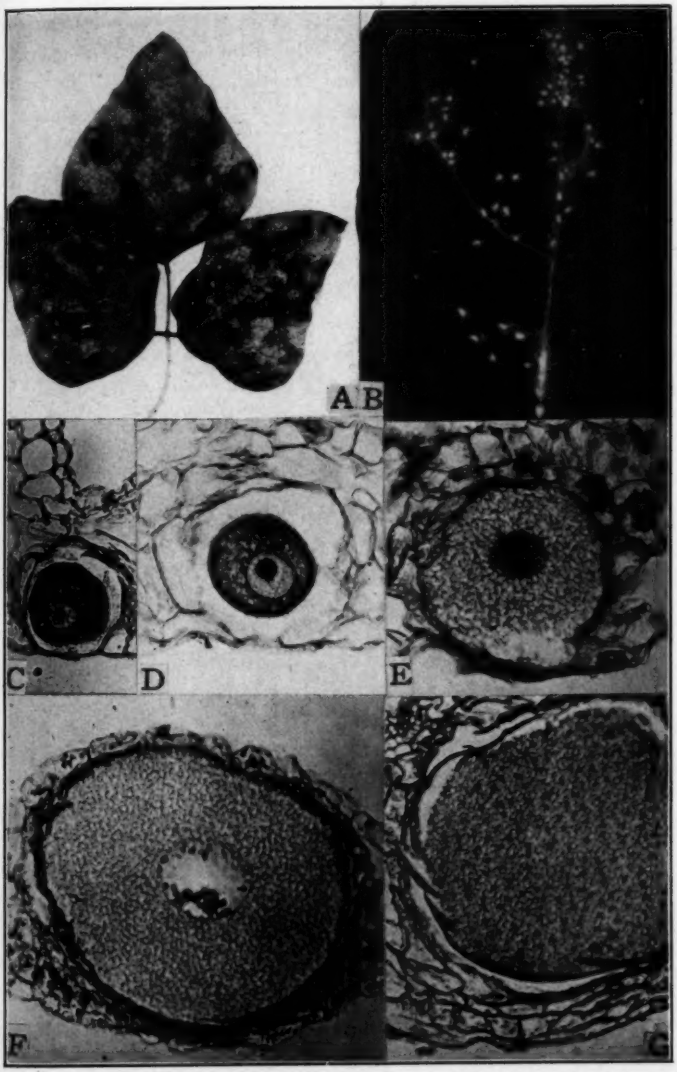


FIG. 1. *Synchytrium decipiens* on *Amphicarpa monoica*. *A–B*, lesions of leaf, natural size and somewhat enlarged to show halo. *C–F*, fungus in infected host cells in various stages of development. *G*, fungus showing many nuclei.

of the midribs and veins, but the age of these cells at time of infection may vary to some extent. The infected host cells enlarge rapidly and the infected area may be slightly swollen. The galls may project on one or both surfaces of the leaf and sometimes more on one side than on the other. The enlarged infected cell may be in contact with one or both epidermal layers or may be separated from one by a layer of mesophyll cells. The host cells around the infected cell divide rapidly, are small and compact and form a zone which is never as definite as the zones in other species studied by the author (FIG. 1, *C–G*). In fact, the fungus causes less modification of host tissue than any other species of this genus studied by the author. The thickening of the mesophyll around the infected cells on the petioles and stems is much greater than in the leaves. In some cases the host cells in contact with the infected cells are elongated (FIG. 2, *D*). When cells of the stems or petioles are infected, there is a pronounced thickening of the cortex and fibrovascular bundles may or may not be slightly enlarged. The epidermal cells never completely close over the infected cells, and the opening to the outside can be seen if the sections are well centered (FIG. 2, *C–D*). The contents of the infected host cell disintegrate and become so inconspicuous, in most cases, that they can scarcely be detected (FIG. 1, *C–D*). The nucleus of the infected cell disappears early and is rarely seen after infection of the cell.

The fungus does not fill the host cell until it is ready to divide into sporangia. It is dense when young, stains very deeply with age, becomes less dense and foamy as it approaches maturity (FIG. 1, *C–E*). In young stages, the wall surrounding the fungus can be detected in stained sections in later stages; it is always thin but well defined. The nucleus, which is not always in the center of the fungus, is rather dense when young but becomes somewhat less dense with age. Segmentation, such as reported in other species studied by the author, was not observed. Many nuclei appeared and this was followed by the formation of sporangial walls (FIG. 1, *G*, FIG. 2, *A–C*) throughout the entire fungus body. The sporangia are more numerous than in any other species studied by the author (FIG. 2, *A-C*). They separate and become spherical (FIG. 2, *C*).

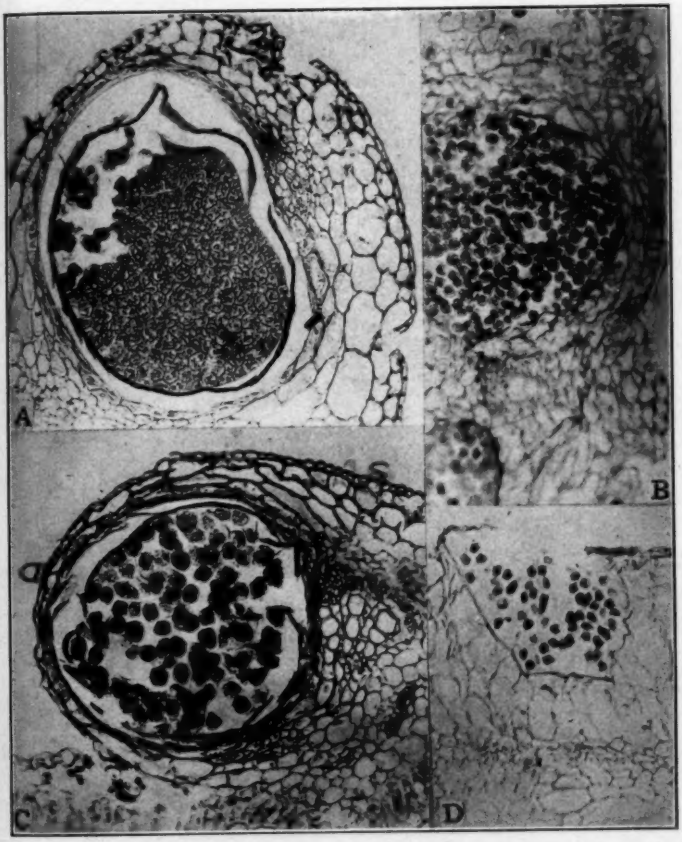


FIG. 2. *Synchytrium decipiens*. *A–C*, showing formation of sporangia. *D*, sporangia surrounded by elongated host cells.

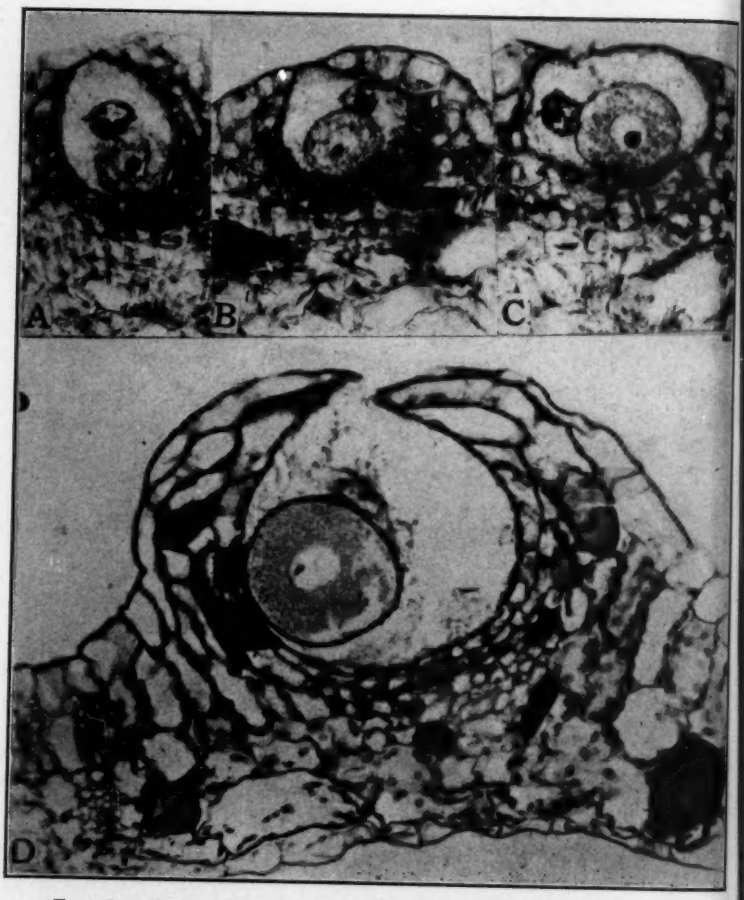


FIG. 3. *Synchytrium Chrysosplenii* on *Chrysosplenium americanum*. *A–C*, early stages of fungus in epidermal cells of host plant, showing large nucleus of host cell. *D*, later stage showing gall and disintegrating host cell nucleus.

SYNCHYTRIUM CHRYSOSPLENII Sorokin

Our knowledge of this species is rather limited. The infections are in the epidermal cells on both surfaces of leaves before the tissues become differentiated to form the palisade and mesophyll cells (FIG. 3, *A–C*). The galls vary in size regardless of age and project from either or both surfaces of the leaves. The infected cells enlarge rapidly with age and become almost spherical or pear-shaped. In some cases they lie almost midway between and in contact with the two epidermal layers. There is very little thickening of the leaves. The host cells surrounding the infected cells grow rapidly, divide and form galls which are completely or half embedded in the tissues of the leaves. The host cells which compose the submerged half of a gall are usually small, rich in protoplasm, with prominent nuclei and form a sheath of two or more layers (FIG. 3, *D*). The host cell nucleus is large and conspicuous. It does not show any evidence of disintegration until the fungus approaches maturity (FIG. 3, *D*). It is usually near the outer side of the cell (FIG. 3, *A–C*). It enlarges for a time and then disintegrates (FIG. 3, *D*). The epidermal cells grow over but never completely cover the infected cell (FIG. 3, *D*). The contents of the infected host cell disintegrate slowly and become foamy in appearance.

When mature, the fungus rarely fills the infected host cell but increases in size until it is about twice the diameter of the host cell nucleus. The wall around the fungus is thin. Later stages were not found in any of the material studied.

The author wishes to express his thanks to Dr. H. M. Fitzpatrick of Cornell University for material and assistance, to Dr. J. S. Karling of Columbia University for advice, to Mr. W. R. Fisher, photographer in the Department of Plant Pathology at Cornell, for photographs FIG. 1, *A* and *B*, and to Dr. C. W. Edgerton of Louisiana State University for advice and for making the photomicrographs.

DEPARTMENT OF BOTANY,
LOUISIANA STATE UNIVERSITY,
BATON ROUGE, LOUISIANA

STUDIES ON SOME FUNGI FROM NORTHWESTERN WYOMING. II. FUNGI IMPERFECTI

LEWIS E. WEHMEYER[1]

(WITH 28 FIGURES)

In a previous paper (**22**), the writer has described the general region and specific localities in Wyoming from which collections were obtained during the summer of 1940. The same place names are used in this account. That paper also included a general discussion of the conclusions reached from a study of a large series of collections of fungi on the stems of a wide variety of herbaceous hosts, and described the Pyrenomycetes found thereon. The present paper is concerned with the Fungi Imperfecti which were found on these same stems, often intimately intermixed with the ascus stages. In some few cases there was some slight correlation between the ascus and conidial stages occurring on the same stems, but these were far too few to be considered as substantial proof of any genetic connection, for, as previously pointed out, these stem inhabiting forms do not seem to be limited in their host range in most cases, and many different species are commonly found growing together on one and the same stem.

APIOCARPELLA MACROSPORA (Speg.) Syd. (FIG. 2)

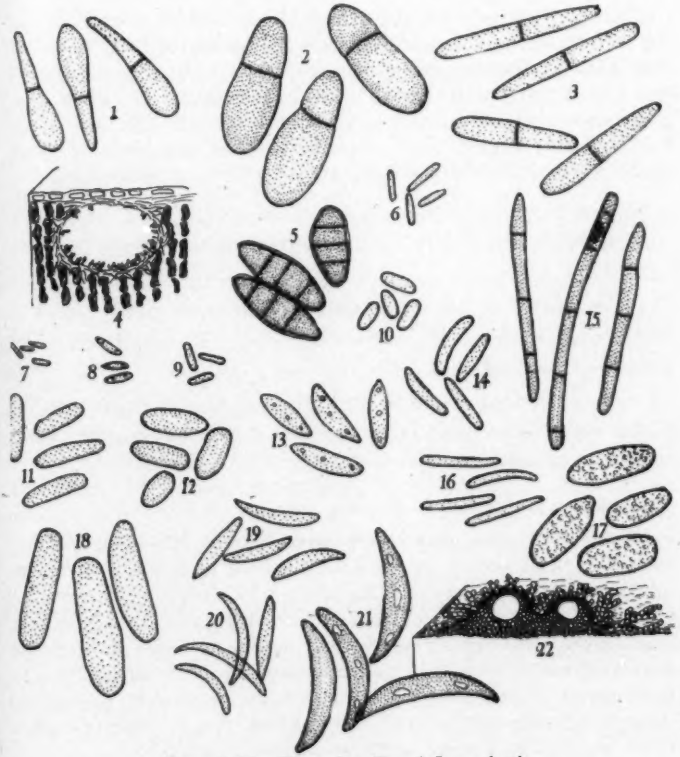
Pycnidia immersed beneath the epidermis in longitudinal rows between the veins, flattened ellipsoid, 200–350 × 100–150 μ, membranous, walls thin, of brown-walled pseudoparenchyma, ostiole minute, papillate, erumpent through the epidermis. Conidia clavate-ellipsoid, tapered toward one end, unequally two-celled, hyaline then pale greenish brown, 23–32 × 8.5–10.5 μ, coarsely granular, smaller cell 9–10 μ long.

Cream Puff Mt.: on leaves and leaf sheaths of an unknown grass, at 9500 ft. July 5 (*1088*).

Spegazzini (**18**, p. 364), in his descriptions of *Apiosporella macrospora* on *Hordeum jubatum* from Tierra del Fuego, gives the

[1] Papers from the Department of Botany of the University of Michigan, No. 765.

pycnidia as 150 μ in diameter, and the spores as somewhat narrower (28–30 × 7–8 μ) and hyaline. This collection is placed here provisionally, for otherwise it fits Spegazzini's description very well. Inasmuch as the name *Apiosporella* was preoccupied by



FIGS. 1–22. Wyoming Fungi Imperfecti.

Apiosporella Höhn. (**9**, VIII, p. 1215), in the Pyrenomycetes, H. & P. Sydow (**20**, p. 43) have substituted the name *Apiocarpella* for Spegazzini's genus.

Apiocarpella Hedysari sp. nov. (FIG. 1)

Pycnidia dispersa rotundata, atra, nitida, depressa vel hemisphaeroidea, 200–300 μ diametro; ostiolo minuto, centrali; pariete tenui ex parenchymate

fusco. Conidia elongata, attenuati-ellipsoidea, hyalina, inaequaliter bicellula, 20–23 μ longa, sursum 4.3–5 μ, deorsum 2.5 μ crassa, cellula superiore crassa rotundata, inferiore attenuata, sed aequilonga.

Specimen typicum in caulibus vetustis *Hedysari* sp., secus viam "Skyline Trail," Teton National Park, Wyoming, 24 Jul., 1940, legit L. E. Wehmeyer, sub numero *1173*.

Thickly scattered as small, circular, shiny, black spots, consisting of the strongly erumpent, flattened to hemispheric pycnidia, 200–300 μ in diameter, with a minute central ostiole and a rather thin membranous wall of brown pseudoparenchyma. Conidia elongate tapered-ellipsoid, hyaline, with two unequal cells, the upper broader and rounded, the lower narrower and tapered, but about equal in length, 20–23 × 4.3–5 μ above, 2.5 μ in diameter below.

Skyline Trail: July 24, on *Hedysarum* sp. (*1173*) (Type).

S. of Teton Pass: July 11, on *Hedysarum uintahense* A. Nels. (*1126g*).

These spores are narrower and the cells more nearly equal in length than those of *A. macrospora*. They are much more tapered and unequally two-celled than in *Diplodina*. On No. *1173* these pycnidia are associated with *Apiosporella alpina* and on No. *1126g* with *Sphaerulina inaequalis*, but a number of other fungi occur on the same stems in both cases.

CERCOSPORA GALII Ell. & Holw.

Forming irregular, gray-brown necrotic areas, 0.5–1 cm. in diameter upon the leaves. On the under side of these areas there are numerous, evenly scattered, black spots, which appear like pycnidia, but prove to be erumpent tuberculate masses of brown hyphae bearing on their surface numerous, lighter colored, short, stout conidiophores, 9–15 × 2.5 μ. These stromatic acervuli are 50–70 μ in diameter. The conidia are long cylindric, straight or slightly curved, with the attached end rather blunt, and the free end more acute, one-celled, hyaline, guttulate, 35–40 × 2.5–3.5 μ.

Hoback Canyon: July 8, on *Galium triflorum* Michx., Red Creek (*1162*).

This appears more like a *Cylindrosporium*, but seems to fit the description of *Cercospora Galii*.

CONIOTHYRIUM SAMBUCI Earle

Pycnidia rather widely scattered, sometimes confluent, formed beneath the epidermis, but soon erumpent, superficial, globose, with

a flattened base, 200–350 μ in diameter, walls of coarse black pseudoparenchyma. Conidia globose to subglobose, 6–7.5 × 6 μ.

S. of Teton Pass: July 11, on *Sambucus microbotrys* Rydb. (*1133a*).

Associated with *Steganosporium tuberculiforme*.

Cylindrosporium Fraserae sp. nov.

Maculae emortuae, circulares vel ellipticae, grisei-brunneae; margine irregulari, atro, incrassato. Stromata minuta, atra, sterilia, lineae marginali similia, in maculas dispersa. Acervuli epiphylli, concolores, in folii contecto immersi, globosi, 100 μ diametro, plerumque de causa conidiorum abscissione modice concavi, hyphis hyalinis. Conidia numerosa, elongata, filiformia, unicellula, 65–70 μ longa, 2–2.5 μ crassa.

Specimen typicum in foliis *Fraserae speciosae* Griseb., prope Camp Davis, Jackson, Wyoming, 7 Jul., 1940, legit L. E. Wehmeyer, sub numero *1094*.

On surface of leaf as scattered, circular or elliptic, gray-brown, necrotic areas, 3–10 × 2–5 mm., bounded by an irregular, finally blackened, raised margin. There are irregular blackened spots in these areas, which when sectioned prove to be sterile stromatic areas similar to the marginal zones. The fruiting structures appear as minute concolorous papillae on the upper surface of the spot. These fruit bodies originate as globose to ellipsoid masses of hyaline interwoven hyphae, some 100 μ in diameter, within the leaf tissue. Numerous elongate, filiform, one-celled, hyaline conidia, 65–70 × 2–2.5 μ, are cut off from the surface of this "acervulus," which becomes somewhat concave as a result of this spore formation.

Camp Davis: on *Frasera speciosa* Griseb., July 7 (*1094*) (Type).

The globose mass of hyphae formed within the leaf gives the fungus the appearance of a *Phleospora*, but the conidia are cut off from the surface of this stroma where it breaks through the epidermis thus placing it, rather, in *Cylindrosporium*.

CYLINDROSPORIUM SPIRAEICOLUM E. & E.

Hoback Canyon: Red Creek, July 18, on *Spiraea lucida* Dougl. (*1160*).

Cascade Canyon: on *Spiraea densiflora* Nutt., June 27 (*1091*).

Ellis (**6**, p. 429) gives this species as forming minute yellow spots, 1–2 mm. in diameter and having clavate, 3–5-septate spores,

40–70 × 3.5–5 μ. This collection shows larger (3–6 mm.) pale red brown spots and guttulate but not septate spores measuring 74–107 × 2.5–3.5 μ. Solheim (**17**, 3, p. 41), however, reports spores of this species, from this same region, as being one- or non-septate and 40–108 × 3–4.5 μ. The clavate form of the spore is also distinctive.

A second collection on *Spiraea densiflora* Nutt., from Cascade Canyon, Teton Nat. Park, June 27, shows more sharply margined angular spots and resinous spore masses resembling rust pustules, with spores 2- to 3-septate and 53–88 × 3.5 μ.

CYLINDROSPORIUM CONSOCIATUM Dearn.

Spores long filiform, with pointed ends, 3–4-septate, 43–62 × 1.5 μ.

Hoback Canyon: July 17, on *Acer glabrum* Torr. (*1155*).

DIPLODIA CLEMATIDEA Sacc.

Pycnidia 250–350 μ in diameter, globose or somewhat depressed, granular, scattered or in seriate groups, often confluent, formed beneath the epidermis, then erumpent, ostiole small, papillate. Conidia oblong-ellipsoid, two-celled (rarely three-celled), not or only slightly constricted at the septum, ends rounded, brown, 10.5–14 × 5–6 μ.

S. of Teton Pass: July 11, on *Clematis Douglassii* Hook. (*1124c* and *1131a*).

Although brief, and made from material from South Africa on *Clematis brachiata*, the description of *D. clematidea* Sacc. (*S. Clematidis* Kalch. & Cke., non Sacc.) fits this material very well. Both collections, made within a quarter of a mile of one another, were associated with *Mycosphaerella dolichospora*, and several other fungi.

DIPLODIA POLYGONICOLA Pk.

Pycnidia small, 150–200 μ in diameter, irregularly scattered, immersed, then erumpent, borne on a more or less well developed system of torulose mycelium. Conidia oblong to broad ellipsoid, two-celled, brown, not constricted at the septum, 12.5–16 × 7–9 μ.

Camp Davis: June 22, on *Castilleja flava* Wats. (*1036*).

There are a number of species of *Diplodia* described with similar spores, but none on related hosts. The nearest seems to be *D. polygonicola* Pk., from Kansas, with minute pycnidia and spores 14–16 × 8–9 μ.

Diplodina attenuata sp. nov. (FIG. 3)

Pycnidia 300–400 μ diametro, 150–200 μ alta, dense et aequaliter per latas areas caulis dispersa, sub epidermate formata sed in superficie ut maculae parvae, rotundae, atrae, cum ostiolo centrali papilliformi manifesta, admodum depressa; pariete crasse parenchymatico. Conidia cylindrica, bicellula, hyalina, 23–32 μ longa, 4–5.5 μ crassa, ad apicem attenuata, guttulata.

Specimen typicum in caulibus vetustis Compositarum (*Helianthellae?*), prope Togwotee Pass, Teton Co., Wyoming, 8 Jul., 1940, legit L. E. Wehmeyer, sub numero *1100d*.

Pycnidia rather thickly and evenly scattered over extended areas of the stem, 300–400 × 150–200 μ, formed beneath the epidermis, but visible on the surface as small circular blackened spots with a central papillate ostiole, strongly flattened, with thick walls of coarse black pseudoparenchyma. Conidia cylindric, straight, usually somewhat tapered toward one end, two-celled, hyaline, with several small guttulae, 23–32 × 4–5.5 μ.

Togwotee Pass: July 8, on some Composite (*Helianthella?*) (*1100d*) (Type).

These spores are much less strongly tapered than in *Apiocarpella Hedysari*. Scattered pycnidia of a very similar *Diplodina*, with somewhat tapered spores 19.5–26 × 4–5 μ, were found mixed in with *Pleospora permunda*, on stems of an unknown Composite, from Glory Mt. (*1024d*).

DIPLODINA FRASERAE (E. & E.) Tracy & Earle

Pycnidia thickly scattered on rather extensive, somewhat discolored areas of the stem or leaf bases, 100–300 μ in diameter, globose, black, erumpent as a minute ostiole and with a wall of black compacted hyphae. Conidiophores short, bearing oblong-cylindric, straight to slightly curved, two-celled, hyaline conidia, 16–21 × 3–5 μ.

Glory Mt.: June 20, on *Frasera speciosa* Griseb. (*1027*).

Ellis (**5**, p. 289) described *Ascochyta Fraserae*, from Colorado, as having pycnidia 80–100 μ in diameter and spores 12–15 × 4–5 μ.

It was later transferred to *Diplodina* by Tracy & Earle. In 1920, Saccardo (Nuov. Giorn. bot. ital. n. s. **27**: 82) described a second *Ascochyta Fraserae* from Spokane, Washington, as having lenticular pycnidia, 150–160 μ in diameter and spores 21–23 × 4.5–5 μ. This collection comes closer to Saccardo's description, but his name is preoccupied by that of Ellis, if Ellis' species is a distinct one. It seems probable, however, that Ellis merely had immature material and that these are all the same species, for the spores are quite variable in size. The pycnidia occur upon both leaves and stems, so the generic difference between *Diplodina* and *Ascochyta* breaks down. Inasmuch as the pycnidial wall is rather coarse and stromatic, and the fungus occurs primarily on stems, the *Diplodina* binomial is used.

Hendersonia pinicola sp. nov. (FIGS. 4–5)

Pycnidia globosa, 100–150 μ diametro, intra mesophyllium folii Pini immersa; ostiolo minuto; pariete prosenchymatico, cum cellulis mesophyllii admixtis. Conidia fusiformiter ellipsoidea vel clavata, fusca, primum unicellula, deinde 4-cellula, ad septa haud constricta, 14–20 μ longa, 5–7 μ crassa, in foliorum superficie in maculis atris aggregata.

Specimen typicum in foliis *Pini Murrayanae*, prope Camp Davis, Jackson, Wyoming, 17 Jun., 1940, legit L. E. Wehmeyer, sub numero *1004a*.

Appearing on the living needles as small irregular, black, paint-like masses of conidia, emitted from globose pycnidia, 100–150 μ in diameter, entirely immersed in the leaf mesophyll and opening by a minute pore. Wall of pycnidium consisting of merely the subhymenial prosenchyma and a few imbedded host cells. Conidiophores short, 5–6 μ in diameter. Conidia fusoid-ellipsoid to clavate, brown, one-celled at first, becoming four-celled, not constricted at the septa, 14–20 × 5–7 μ.

Camp Davis: June 17, on living needles of *Pinus Murrayana* Balf., leg. L. E. Wehmeyer (*1004a*) (Type).

Hendersonia acicola Münch. & Tub., with somewhat smaller spores (11–15 × 4–5 μ), is very similar to this collection. Lagerberg's figures (**12**, figs. 6 & 7) of *H. acicola* are characteristic of this collection, except for the greater constriction at the septa in his figures. This collection is kept as a separate species because of the additional fact that it is found associated with *Hypodermella concolor* in much the same manner as *Hendersonia acicola* has been found associated with *Hypodermella sulcigena* (**12**).

HETEROPATELLA UMBILICATA (Pers.) Jaap

Pycnidia usually rather widely scattered, 200–600 × 150–200 μ, depressed spheric, formed beneath the epidermis but soon erumpent-superficial, often with fragments of this tissue adhering, soon strongly pezizoid collapsed. Walls membranous, thin, composed of small dark-walled pseudoparenchyma cells which are arranged in a radiate and "asterinoid" manner about the central ostiole which splits radially to release the spore content. Conidia hyaline, long fusoid, lunate, curved, with a tapered base where attached and at the apex a long filiform appendage up to 28 μ in length, bi-septate when mature, but often with only one or no septum visible, with several small droplets on each side of the septum, 18–22 × 1.5–2.5 μ, without the appendage.

S. of Teton Pass: July 11, on *Hedysarum uintahense* A. Nels. (*1126*); *Aquilegia coerulea* James (*1114b*); *Carum Carui* L. (*1132b*); *Agastache urticifolia* (Benth.) Rydb. (*1121c*); *Linum Lewisii* Pursh (*1134g*); *Pedicularis contorta* Benth. (*1135b*) and *Delphinium Brownii* Rydb. (*1129e*).

Glory Mt.: June 20, on *Cynomarathrum Parryi* (S. Wats.) Coult. & Rose (*1028a*).

Togwotee Pass: July 8, on *Myosotis alpestris* Schmidt (*1213*) and *Helianthella* sp. (?) (*1100*).

Skyline Trail: July 24, on *Carum Carui* L. (*1166g*) and *Aconitum Bakeri* Greene (*1169c*).

The proper binomial for this fungus is an open question. It was described from the arctic and subarctic, as *Septoria cercosperma,* by Rostrup (**15**, p. 41), and from Beeren Island, as *S. caudata,* by Karsten (**11**, p. 38), both of which were transferred to *Rhabdospora* by Saccardo. In 1885, Ellis & Everhart (**3**, p. 153) erected the genus *Kellermania* for such pycnidial forms with appendaged spores, and his *K. alpina* (**7**, p. 57), on *Aquilegia,* from the mountains of Colorado, is no doubt this fungus. In 1910, Lind (**13**, p. 159) made the combination *Kellermania cercosperma* and suggested that *K. yuccagena* E. & E., *K. polygoni* E. & E., *K. Sisyrinchii* E. & E., and *K. Rumicis* Fautr. & Lamb. might all be the same species. The recorded measurements of spores for these species of *Kellermania* vary from 15–18 × 4 to 45–50 × 10–12 μ, but the larger measurements include the length of the appendage,

which is quite variable. In 1923, this same fungus was reported as *Discosia acuta* Dearn. by Dearness (**2**, p. 18) from northern Canada. In 1926, Lind (**14**, p. 170) stated that *Heteropatella umbilicata* (Pers.) Jaap from the Swiss Alps is this same fungus and gives its synonymy in which only *Kellermania cercosperma* and *K. Rumicis,* of the above mentioned species of this genus, are included. The flattened pycnidium and the radiate cell arrangement of the upper wall, with the radiate splitting about the ostiole, would no doubt allow this fungus to be placed in *Heteropatella,* in which case *Kellermania* would be a synonym of that genus. *Heteropatella* was originally described as having one-celled spores, but these have been found to become septate. Grove (**8**, v. 2, p. 159) lists several of these synonyms as doubtfully in the genus *Heteropatella,* and Sprague and Cooke (**19**, p. 48) have reported this species under the name of *Heteropatella alpina* (E. & E.) W. B. Cooke, which should be a synonym. As pointed out by Lind (**14**, p. 170), *Heteropatella* has been considered the conidial stage of species of *Heterosphaeria.* In the Wyoming material, it was found associated with many different pyrenomycetous fungi, but no associated *Heterosphaeria* was found in any case.

Whatever the proper name may be, this is one of our most widespread arctic-alpine forms and is reported upon in nearly all the floras of such regions. In Wyoming, the twelve collections were taken from four stations, all of which have an elevation of 9000 feet or more.

Leptostroma Lupini sp. nov. (FIG. 6)

Pycnidia depressa, 250–400 μ diametro, 70–100 μ alta, dense dispersa vel confluentia, primum subepidermalia, deinde superficialia, in superficie caulis ut maculae irregulares vel elliptices, 250–1000 μ longae evidentia, superficialiter corrugata, per rimam unam (vel plures) efferentia; pariete prosenchymatoso, sursum atribrunneo, 10–15 μ crasso, deorsum discolori. Conidia cylindrica, bacilliformia, unicellula, hyalina, 9–10.5 μ longa, 1.5–2 μ crassa, ex conidiophoris brevibus.

Specimen typicum in caulibus *Lupini candicantis* Rydb., prope locum dictum "Togwotee Pass," Teton County, Wyoming, 8 Jul., 1940, legit L. E. Wehmeyer, sub numero *1101b.*

Pycnidia on surface as more or less scattered or confluent, elliptic to irregularly flattened, black spots, 250–1000 μ long with a wrinkled surface and opening by one or several elongate slits.

They are subepidermal, but the epidermis soon disappears, leaving them superficial. Pycnidia flattened, 250–400 × 70–100 μ, outer walls of dark brown prosenchyma, 10–15 μ thick, basal wall of discolored host tissue. Conidiophores short, bearing cylindric, bacillar, one-celled, hyaline conidia, 9–10.5 × 1.5–2 μ.

Togwotee Pass: July 8, on *Lupinus candicans* Rydb. (*1101b*) (Type); and *Lupinus* (*parviflorus?*) (*1103a*).

Pellionella tetonensis sp. nov. (FIGS. 25–26)

Pycnidia superficialia, dense dispersa vel aggregata, globosa, carbonacea, atra, 300–500 μ diametro; collo cylindrico, elongato, 400–500 μ longo; pariete 40–50 μ crasso, bistratoso, extus crasso, atro, intus tenui, hyalino, parenchymatoso. Conidia cylindrica vel oblongi-ellipsoidea, bicellula, non constricta, 8–9 μ longa, 2.5 μ crassa, primum hyalina deinde fusca, abscissa ex conidiophoris in pariete pycnidiorum interiore.

Specimen typicum in caulibus vetustis *Lupini parviflori* Nutt., prope Teton Pass, Jackson, Wyoming, 11 Jul., 1940, legit L. E. Wehmeyer, sub numero *1110b*.

Appearing on the surface as crowded or clustered, superficial, globose, carbonaceous, black pycnidia, 300–500 μ in diameter, with an elongate, cylindric, ostiolar neck, 400–500 μ in length. Pycnidial wall 40–50 μ thick, consisting of an outer layer of thick, black-walled, and a thinner, inner, hyaline-walled pseudoparenchyma. Wall lined with short conidiophores bearing the cylindric, oblong-ellipsoid, two-celled, non-constricted conidia, which are hyaline at first but soon become brown and 8–9 × 2.5 μ.

S. of Teton Pass: July 11, on *Lupinus parviflorus* Nutt., leg. L. E. Wehmeyer (*1110b*) (Type).

The superficial position of these pycnidia is that of the form genus *Diplodiella,* but the elongate ostiolar necks place them in *Pellionella.* No species with these large pycnidia and small spores could be found in either of these genera.

Phaeoseptoria Scirpi sp. nov. (FIG. 15)

Pycnidia late sed aequaliter dispersa, 100–150 μ diametro, in contextum caulis immersa, erumpentia ut puncta minuta, atra; pariete 5–10 μ crasso, atro, parenchymatico. Conidia longe cylindrici-filiformia, modice curvata, 38–46 longa, 2–3 μ crassa, saepe triseptata vel intus 4-partita, prope septa guttulata, pallide lutea, communiter lutei-brunnea.

Specimen typicum in culmis *Scirpi validi* Vahl, ad Elk Refuge, Jackson, Wyoming, 1 Jul., 1940, legit L. E. Wehmeyer, sub numero *1071b*.

Pycnidia widely but evenly scattered, immersed in the stem tissue, 100–150 μ in diameter, erumpent as minute black spots, wall 5–10 μ thick, of dark colored pseudoparenchyma. Conidia long cylindric-filiform, somewhat curved, often triseptate, or with a four-parted protoplast, with minute droplets near the partitions, pale yellow in color, yellow-brown in mass, 38–46 × 2–3 μ.

Elk Refuge, Jackson, Wyo.: on *Scirpus validus* Vahl, July 1, leg. L. E. Wehmeyer (*1071b*) (Type).

This species was found associated with *Metasphaeria juncinella* (*1071a*) and might be its conidial stage. The colored conidia place it in *Phaeoseptoria*. Similar species are *Septoria Scirpi* Sacc. with similar but hyaline spores and *S. narvisiana* Sacc. with dilute olive, but 5–7-septate spores.

PHOMA

The taxonomic situation in the genus *Phoma* is similar to that mentioned under *Mycosphaerella* (22). So many species of similar morphology have been described upon the basis of host differences, that this means of distinction is practically forced upon one, even though it seems probable that a species may not be limited in its host range. In Table I, the collections of *Phoma* and *Macrophoma* are arranged according to their spore measurements, and more or less arbitrarily divided into species as indicated by the lines of separation.

Phoma bacilliformis sp. nov. (FIG. 7)

Pycnidia dense dispersa, in areis obscuris caulium *Senecionis*, 200–300 μ diametro, immersa; ostiolo brevi cylindrico, per epidermatem erumpente; pariete tenui, 10–20 μ crasso, in aetate modice collapsa. Conidia brevia, cylindrica, bacilliformia, hyalina, 2–3 μ longa, 0.8–1 μ crassa.

Specimen typicum in caulibus vetustis *Senecionis*, secus viam "Skyline Trail," Teton National Park, Wyoming, 24 Jul., 1940, legit L. E. Wehmeyer, sub numero *1177b*.

Pycnidia thickly scattered on somewhat discolored areas of the stem, flattened spheric, 200–300 μ in diameter, immersed, erumpent through the epidermis as short, prominent, cylindric ostioles, thin-walled (10–20 μ), collapsing somewhat in age. Conidia short, cylindric, bacilliform, hyaline, 2–3 × 0.8–1 μ.

TABLE I

No.	Host	Spore Range	Pycnidia
1177b	SENECIO	2–3×0.8–1	200–350
1075	LACTUCA	3.5–4×1–1.5	70–100
1086c	PENSTEMON	3.5–4.5×1–2	150–250
1185d	DRABA	3.5–5.5×1–2	200–250
1074	POLEMONIUM	4–5.5×2.5–3	200–300
1065b	LUPINUS	4–7×2.5–3.5	200–350
1095a	PEDICULARIS	7–11×1.5–2	200–250
1097b	PEDICULARIS	7–11×1.5–2	200–250
1035a	PEDICULARIS	(6) 7–9×2–2.5	200–400
1032b	SYNTHERIS	7–10.5×2–2.5	200–250
1109c	AGASTACHE	7–9×2.5–3.5	200–300
1128c	VALERIANA	8.5–9.5×2.5	200–300
1055b	SPHAERALCEA	9–11 (13)×2.5–3.5	200–300
1090	LINUM	9–15×2.5–3.5	100–150
1211a	GILLIA	10–14×1.5–2	200–300
1022b	UMBELLIFER	10–14×1.5	350–500
1113c	ERIGERON	12.5–14×2–2.5	100–150
1016c	PENSTEMON	12–15×5–6	150–250
1171a	MIMULUS	18–26×5–6.5	200–250

Skyline Trail: July 24, on *Senecio* sp. (*1177b*) (Type).

This collection differs from all of the others in the very small spores.

Phoma pulchellicola sp. nov. (FIG. 8)

Pycnidia in areis mycelii atrifuscis, dense septatis superficialis reptantis dispersa; subepidermalia, parva, 70–100 μ diametientia, atribrunnea, poro uno perforata; hyphis superficialibus saepe lateraliter in ligulis unitis. Conidia minuta, fusiformia, eseptata, hyalina, biguttulata, 3–5 μ longa, 1–1.5 μ crassa.

Specimen typicum in caulibus vetustis *Lactucae pulchellae* (Pursh) DC., prope Snake River, Jackson, Wyoming, 11 Jul., 1940, legit L. E. Wehmeyer, sub numero *1075*.

Pycnidia on small blackened areas caused by a rich dark brown, closely septate, creeping, superficial mycelium, with the hyphae often united into ribbon-like strands. Pycnidia subepidermal, small, 70–100 μ in diameter, dark brown, with a pore-like opening.

Conidia minute, fusoid, one-celled, hyaline, 3.5–4 × 1–1.5 μ, with a small guttula in each end.

On *Lactuca pulchella* (Pursh) DC., Snake River, Jackson, Wyo., July 11, 1940, leg. L. E. Wehmeyer (*1075*) (Type).

The spores and pycnidia of this collection are similar to those given for *Phyllosticta decidua* Ell. & Kell., which has been reported from many hosts including *Lactuca,* from Wisconsin, by J. J. Davis. Tehon (**21**, p. 245), however, describes a new species *Phyllosticta scariolicola,* on the basis of its occurrence upon a separate host species of *Lactuca,* and states that the differences of host limitation and ascus stage association in the *decidua* group make this advisable. If such theoretical differences are used in the separation of species, it forces one to describe this species as new because of its different specific host or monograph the group in order to find its proper position.

Phoma jejuna sp. nov. (FIG. 9)

Pycnidia distanter vel dense dispersa, paulo depressa, 150–300 μ diametro, pariete tenui. Conidia breviter cylindrica, unicellula, bacilliformia, hyalina, 3.5–5.5 μ longa, 1–2 μ crassa.

Specimen typicum in caulibus vetustis *Penstemonis stenosepali* (Gray) Howell, in loco dicto "Cream Puff Mt.," Jackson, Wyoming, 5 Jul., 1940, legit L. E. Wehmeyer, sub numero *1086c*.

Pycnidia widely or thickly scattered, somewhat depressed-spheric, thin-walled, 150–300 μ in diameter. Conidia oblong-cylindric, bacillar, one-celled, hyaline, 3.5–5.5 × 1–2 μ.

Cream Puff Mt.: July 5, on *Penstemon stenosepalus* (Gray) Howell, leg. L. E. Wehmeyer (*1086c*) (Type).

Hoback Canyon: Red Creek, July 29, on *Draba luteola* Greene (*1185d*).

Phyllosticta Pentastemonis Cke., the only species described on these hosts, which approaches these collections, has spores which are oblong-ovoid to ellipsoid and 5 × 3 μ, which are more like those of the following species with broader spores.

Phoma minuta sp. nov. (FIG. 10)

Pycnidia dense dispersa, depressiuscule globosa, 200–350 μ diametro; ostiolo papilliformi, centrali. Conidia cylindrica vel breviter ellipsoidea, unicellula, hyalina, 4–6 (7) μ longa, 2–3 μ crassa.

Specimen typicum in caulibus vetustis *Polemonii occidentalis*, ad Elk Refuge, Jackson, Wyoming, 1 Jul., 1940, legit L. E. Wehmeyer, sub numero *1074*.

Pycnidia thickly scattered, somewhat depressed spheric, with a central papillate ostiole, 200–350 μ in diameter. Conidia one-celled, hyaline, cylindric to oblong-ellipsoid, 4–6 (7) × 2–3 μ.

Elk Refuge, Jackson, Wyo.: on *Polemonium occidentale* Greene, July 1, leg. L. E. Wehmeyer (*1074*) (Type).

Camp Davis: June 26, on *Lupinus parviflorus* Nutt. (*1065b*).

No similar species seems to be described on either of these hosts. This species resembles the last except for the broader spores.

Phoma Pedicularis sp. nov. (FIG. 14)

Pycnidia dispersa, depresse globosa, 200–250 μ diametro, in cellulas subepidermales immersa. Conidia cylindrica, recta vel paulum curvata, hyalina, 7–11.5 μ longa, 1.5–2 μ crassa.

Specimen typicum in caulibus vetustis *Pedicularis bracteosae* Benth., prope Togwotee Pass, Teton Co., Wyoming, 8 Jul., 1940, legit L. E. Wehmeyer, sub numero *1095a*.

Pycnidia scattered, depressed-spheric, 200–250 μ diameter, immersed beneath the epidermis. Conidia cylindric, straight or slightly curved, one-celled, hyaline, 7–11.5 × 1.5–2 μ.

Togwotee Pass: July 8, on *Pedicularis bracteosa* Benth., leg. L. E. Wehmeyer (*1095a*) (Type), and *P. racemosa* Dougl. (*1097b*).

This species is similar to *P. herbicola* and *P. herbarum*, but has narrower spores than either. It is also similar to *P. montenegrina* Bub., but has larger pycnidia. Both collections were found in association with *Apiosporella alpina*.

Phoma herbicola sp. nov. (FIG. 11)

Pycnidia dispersa vel aggregata, sub epidermate immersa, deinde superficialia, depressiuscule globosa, 200–400 μ diametro; ostiolo centrali, perforato; pariete crasso, ex parenchymate crasso, atro. Conidia cylindrica vel subellipsoidalia, continua, hyalina, (5.5) 7–10.5 μ longa, 2–2.5 μ crassa.

Specimen typicum in caulibus vetustis *Syntheris dissectae* Rydb., in monte dictu, "Glory Mountain," Jackson, Wyoming, 20 Jul., 1940, legit L. E. Wehmeyer, sub numero *1032b*.

Pycnidia scattered or grouped, sub-epidermal, becoming erumpent, somewhat depressed-spheric, 200–400 μ in diameter, with a

central pore-like ostiole and thick walls (40–50 μ) of coarse dark pseudoparenchyma. Conidia cylindric to cylindric-ellipsoid, one-celled, hyaline, (5.5) 7–10.5 × 2–2.5 μ.

Glory Mt.: June 20, on *Syntheris dissecta* Rydb., leg. L. E. Wehmeyer (*1032b*) (Type).

Teton Pass Rd.: June 20, on *Pedicularis bracteosa* Benth. (*1035a*).

These collections are very similar to those given under *P. herbarum*, but the conidia are somewhat narrower and more cylindric. *P. coloradensis* Earle, on *Pedicularis*, is given with spores 8–10 × 3–4 μ, which are more like those of *P. herbarum*.

PHOMA HERBARUM West.

Pycnidia rather widely scattered, just beneath the epidermis, slightly depressed globose, 200–300 μ in diameter, with a central papillate ostiole. Conidia cylindric to cylindric-ellipsoid, one-celled, hyaline, 7–11 × 2.5–3.5 μ.

Hoback Forest Camp: June 25, on *Sphaeralcea rivularis* (Dougl.) Torr. (*1055b*).

S. of Teton Pass: July 11, on *Valeriana* sp. (*1128c*) and *Agastache urticifolia* (Benth.) Rydb. (*1109c*).

Phoma herbarum and its many varieties on various herbaceous stems are given as having spores 6–11 × 3–4 μ. These collections seem to fit it most closely. The variety on *Valeriana* is given by Saccardo (Syll. Fung. **3**: 133) as having spores 6 × 3.5 μ. The collection on *Agastache* is similar to *P. Lophanthi* Bub., but that species has narrower spores (1.5–2 μ). On *Sphaeralcea* the spores (9–11–13 μ) are somewhat longer than on the other hosts (7–9 μ).

Phoma fusispora sp. nov. (FIG. 13)

Pycnidia dense dispersa, 100–150 μ diametro, depresse globosa, in maculis griseis cum hyphis reptantibus, fuscis, superficialibus; ostiolo perforato, deinde late fisso, ultimum basi cupuliforme. Conidia fusiformia vel fusiformiter ellipsoidalia, continua, hyalina, 9–15 μ longa, 2.5–3.5 μ crassa.

Specimen typicum in caulibus vetustis *Lini Lewisii* Pursh, in monte dictu, "Cream Puff Mountain," Jackson, Wyoming, 5 Jul., 1940, legit L. E. Wehmeyer, sub numero *1090*.

Pycnidia thickly scattered, with a certain amount of creeping brown surface mycelium, giving the infected areas a somewhat grayish discolored appearance, depressed-globose, 100–150 μ in diameter, ostiolar opening at first perforate, then somewhat elongate and finally widely ruptured, leaving only the cup shaped base of the pycnidium. Conidia fusoid to fusoid-ellipsoid, one-celled, hyaline, 9–15 × 2.5–3.5 μ.

Cream Puff Mt.: July 5, on *Linum Lewisii* Pursh, legit L. E. Wehmeyer (*1090*) (Type).

This differs from the *P. herbarum* collections in the longer, more fusoid spores and the surface hyphal growth. *P. linicola* Bub. has curved allantoid spores 7–11 × 2.5–3.5 μ.

Phoma linearispora sp. nov. (FIG. 16)

Pycnidia dense sub epidermate paulum discolore dispersa, circumscriptione rotunda vel elliptica, 300–500 × 200–350 μ, depresse globosa; ostiolo cylindrico, papilliformi vel paulum elongato, erumpente; pariete 20–30 μ crasso, parenchymatoso, parvicellulo, atrimembranoso. Conidia longe cylindrica, continua, hyalina, recta vel paulum curvata, 4-guttulata, interdum subconstricta, 10–14 μ longa, 1.5–2 μ crassa.

Specimen typicum in caulibus vetustis plantarum Umbelliferarum, prope Teton Pass, Jackson, Wyoming, 20 Jun., 1940, legit L. E. Wehmeyer, sub numero *1022b*.

Pycnidia rather thickly scattered, circular to elliptic in outline, 300–500 × 200–350 μ, immersed beneath the slightly discolored epidermis, flattened-spheric and erumpent as a papillate to slightly elongate, cylindric ostiole, wall 20–30 μ thick, of small dark walled pseudoparenchyma. Conidia long-cylindric, one-celled, hyaline, straight to slightly curved, with four or more small droplets and sometimes with the suggestion of a central constriction, 10–14 × 1.5–2 μ.

S. of Teton Pass: June 20, on *Umbellifer* stems (*1022b*) (Type) and *Gillia Watsonii* Gray (*1211a*).

Phoma wyomingensis sp. nov. (FIG. 17)

Pycnidia dense dispersa, 150–250 μ diametro, aspera, globosa, vel depressa, erumpentia, deinde superficialia; ostiolo centrali, papilliformi; pariete 20–40 μ crasso, atro, crasse parenchymatoso. Conidia cylindrica, unicellula, hyalina, crasse granulosa, 12–15 μ longa, 5–6 μ crassa, in conidiophoris crassis.

Specimen typicum in caulibus vetustis *Penstemonis glabrae* Pursh, prope Camp Davis, Jackson, Wyoming, 18 Jun., 1940, legit L. E. Wehmeyer, sub numero *1061c*.

Pycnidia thickly scattered, rough, black, erumpent-superficial, globose to flattened, 150–250 μ in diameter, with a central, papillate ostiole and a thick (20–40 μ) wall of very black, thick-walled pseudoparenchyma. Conidia cylindric-oblong, one-celled, hyaline, with a coarsely granular cytoplasm, 12–15 × 5–6 μ, borne on short conidiophores.

Camp Davis: June 18, on *Penstemon glaber* Pursh (*1016c*) (Type).

This could be placed in *Macrophoma*, but there is no similar species described on *Penstemon*, in either genus.

Phoma selenophomoides sp. nov. (FIG. 19)

Pycnidia 100–150 μ diametro, dense dispersa, depresse globosa, sub cuticula formata, deinde erumpentia, superficialia, et paulum collapsa. Conidia fusiformia, inaequilateralia vel paulum curvata, continua, hyalina, guttulata, 12.5–14 μ longa, 2–2.5 μ crassa.

Specimen typicum in caulibus vetustis *Erigerontis salsuginosi* Gray, prope Teton Pass, Jackson, Wyoming, 11 Jul., 1940, legit L. E. Wehmeyer, sub numero *1113c*.

Pycnidia 100–150 μ in diameter, shiny black, scattered locally, formed beneath the cuticle and soon erumpent-superficial, flattened-spheric, becoming somewhat collapsed, with a minute papillate ostiole. Conidia fusoid, inequilateral or somewhat curved, one-celled, hyaline, with small guttulae, 12.5–14 × 2–2.5 μ.

S. of Teton Pass: July 11, on *Erigeron salsuginosus* Gray (*1113c*) (Type).

This species is barely covered by the cuticle and soon becomes superficial and appearing as an *Aposphaeria*. The spores approach the shape of those found in *Selenophoma*.

Macrophoma Mimuli sp. nov. (FIG. 18)

Pycnidia dispersa, immersa, depressiuscule globosa, 200–250 μ diametro; pariete 40–50 μ crasso, ex parenchymate crasso, atro. Conidia continua, hyalina, cylindrici-fusiformia, recta vel paulum curvata, 18–26 μ longa, 5–6.5 μ crassa.

Specimen typicum in caulibus vetustis *Mimuli Lewisii* Pursh, secus viam "Skyline Trail," Teton National Park, Wyoming, 24 Jul., 1940, legit L. E. Wehmeyer, sub numero *1171a*.

Pycnidia scattered, immersed, somewhat depressed-spheric, 200–250 μ in diameter, walls thick (40–50 μ), of coarse black pseudoparenchyma. Conidia one-celled, hyaline, cylindric to fusoid-cylindric, straight or slightly curved or bent, 18–26 × 5–6.5 μ.

Skyline Trail: July 24, on *Mimulus Lewisii* Pursh (*1171a*) (Type).

This is associated with *Apiosporella Mimuli* and may be its conidial stage.

Phyllosticta Pachystimae sp. nov.

Efficiens argentationem foliorum de causa separationis epidermatis a chlorenchymate. Pycnidia epiphylla, dense dispersa, in tota superficie folii, ut puncta minuta, irregularia, dispersa, 150–170 × 80–100 μ, sub epidermate ruguloso; pariete tenuiusculo. Conidia ellipsoidalia vel fusiformiter ellipsoidalia, continua, hyalina, 9–14 μ longa, 4–5 μ crassa; pariete incrassato, in conidiophoris brevibus, apice angustatis.

Specimen typicum in foliis *Pachystimae Myrsinitis*, prope Granite Creek, Hoback Canyon, Jackson, Wyoming, 1 Aug., 1940, legit L. E. Wehmeyer, sub numero *1198*.

Causing a graying or silvering of the leaves as a result of the separation of the epidermis from the internal tissues. Pycnidia epiphyllous, thickly scattered over the entire leaf surface as minute dots, flattened, 150–170 × 80–100 μ, imbedded beneath the often wrinkled epidermis, irregular in shape, walls rather thin. Conidiophores short, taper-pointed, bearing the ovoid to fusoid-ellipsoid, one-celled, hyaline conidia, which are very thick-walled and measure 9–14 × 4–5 μ.

Hoback Canyon: Granite Creek Canyon, Aug. 1, on *Pachystima Myrsinites* Raf. (*1198*) (Type).

PHYLLOSTICTA ARNICAE (Fck.) Sacc.

Forming large, circular, brown, dead spots, with a yellow margin. The conidia in this collection are cylindric, bacillar, hyaline, 3–3.5 × 0.5–0.8 μ.

Hoback Canyon: Red Creek, June 30, on *Arnica* sp. (*1186*).

The conidia of *P. Arnicae* are given as 6 × 1 μ, but Seaver (**16**), in his account of the Phyllostictales, gives the spores of a Colorado specimen as 3–4 × 1 μ, and Solheim (**17**, 2, p. 96) gives the spores of a Wyoming specimen as 3–5–7 × 1 μ. This collection seems to fit these American reports.

RHABDOSPORA PLEOSPOROIDES Sacc. var. **Drabae** var. nov.

Pycnidia dispersa, sub epidermate, 200–400 μ diametro, depressa, paulum collapsa vel cupuliformia; ostiolo brevi, cylindrico; pariete membranoso, parenchymatoso. Conidia longe fusiformia, acicularia, plerumque utrinque

attenuata sed interdum rotundata, longitudine in tres greges inter se differentes separata, aut 8.5–14 aut 23–33 aut 40–50 μ longa, 0.8–1 μ crassa.

Specimen typicum in caulibus vetustis *Drabae luteolae* Greene, prope Red Creek, Hoback Canyon, Jackson, Wyoming, 29 Jul., 1940, legit L. E. Wehmeyer, sub numero *1185c*.

Pycnidia scattered, subepidermal, 200–400 μ in diameter, flattened, somewhat collapsed or saucer-shaped, with a short cylindric, central ostiole, wall membranous, parenchymatous. Conidia long fusiform, needle-like, usually tapered at both ends, but sometimes rounded, one-celled, hyaline, occurring in three different length groups, 8.5–14, 23–33, or 40–50 × 0.8–1 μ.

Hoback Canyon: Red Creek, July 29, on *Draba luteola* Greene (*1185c*) (Type).

When first examined this collection was assumed to have three species of *Septoria* upon it, because the spores in separate pycnidia seemed to be of different lengths. However, spores of several lengths were later often found in one and the same pycnidium. Spores of the two shorter lengths are the more common. All spores are of the same diameter and general shape. Whether these spores are formed in different lengths or are the result of fragmentation, could not definitely be determined, but the former seems to be the more probable case. There are often a few brownish rhizoidal hyphae growing out from the lower side of the pycnidium.

In general, this collection fits very well the description of *Rhabdospora Cirsii* Karst. Grove (**8**, 1, p. 437) gives *Septoria* (*Rhabdospora*) *pleosporoides* var. *Cirsii* Karst. as a synonym of this species and says that it is reported as the conidial stage of *Leptosphaeria dolioloides* var. *Cirsii* or *Ophiobolus Cirsii*. *Leptosphaeria eustoma* is found on the above stems of *Draba*. Several varieties of *R. pleosporoides* with spores varying from 20 to 52 μ in length have been described on different hosts. My collection no doubt belongs to this same species complex. It differs in the presence of three different length-groups among the spores.

SELENOPHOMA DONACIS var. STOMATICOLA (Baüml.) Sprague & A. G. Johnson (FIG. 20)

On surface as thickly scattered, seriately arranged, circular to elliptic, black dots, which are the immersed pycnidia, 80–150 μ in

diameter, which open by a central pore-like ostiole, have a pseudoparenchymatic wall and cause a slight grayish discoloration of the surface. Conidia lunate-fusoid, somewhat curved, ends acute, one-celled, hyaline, 14–20 × 1.5–2 μ.

Cream Puff Mt.: July 5, on culms of an unidentified grass (*1088a*).

This material was sent to Dr. R. Sprague, who kindly identified it as the above variety (MYCOLOGIA **37**: 639), characterized by the somewhat shorter spores.

Selenophoma maculicola sp. nov. (FIG. 21)

Pycnidia globosa vel depressa, 100–200 μ diametro, singula vel confluentia, stromatica, in maculis atris, minutis, ex hyphis fuscis, reptantibus, torulosis formatis. Conidia lunati-fusiformia, curvata, ad apicem acuta, unicellula, hyalina vel pallide lutea, 23–26 μ longa, 4.5–5 μ crassa.

Specimen typicum in caulibus vetustis *Pseudocymopteri anisati* (Gray) C. & R., prope Hoback Canyon, Jackson, Wyoming, 16 Jul., 1940, legit L. E. Wehmeyer, sub numero *1221a*.

Forming small blackened spots, consisting of radiating or matlike masses of toruloid, dark brown hyphae, upon which the pycnidia arise as thickened, globose or flattened, often confluent masses with one or several cavities 50–100 μ in diameter. Pycnidia 100–200 μ in diameter. Conidia lunate-fusoid, somewhat curved, acute at the ends, one-celled, hyaline or faintly yellowish, 23–26 × 4.5–5 μ.

Hoback Canyon: July 16, on *Pseudocymopterus anisatus* (Gray) C. & R. (*1221a*) (Type).

Dr. R. Sprague (in litt.), who kindly examined this material also, states that he has not seen this *Selenophoma* during his extensive studies of the genus. He rightly points out that the method of formation and character of the pycnidia are somewhat atypical for this genus.

SEPTORIA PUNCTOIDEA Karst.

Elk Refuge: Jackson, Wyo., July 1, on *Juncus filiformis* L. (*1072d*).

This species is associated with *Mycosphaerella perexigua* (see discussion (**22**) under that species).

SEPTORIA SYMPHORICARPI E. & E.

Spots irregular, 2–10 mm. in diameter, bounded by the veins, with a central tan, necrotic area, bearing the immersed, thin-walled pycnidia, which are 100–150 μ in diameter. Conidia long cylindric, occasionally somewhat fusoid toward the ends, often apparently uni- to tri-septate, 41–70 × 2–2.5 μ.

Camp Davis: July 7, on *Symphoricarpos pauciflorus* (Robb.) Britt. (*1093*).

This fits the description of Ellis' species except for the larger spots and longer spores. Solheim (**17**, 3, p. 39) in describing a new species (*S. signalensis*) on *Symphoricarpos orophilus*, differing in the broader (3–4 μ) spores, states that he finds the spores of *S. Symphoricarpi* to be 30–64 × 2–2.5 μ, which would fit this collection.

Sirexcipula wyomingensis sp. nov. (FIGS. 23–24)

Pycnidia sub epidermate formantia, mox erumpentia et superficialia, 250–600 μ diametro, primum subglobosa vel modice depressa, deinde pezizoidea vel irregulariter collapsa, cum uno papillo vel crista ventrali; pariete tenui, atri-parenchymatico, sursum cellulis modice radiatis dispositis; ostiolo fissiformi, rimoso, aetate radiato. Conidiophori numerosi, filiformes, paralleles, hyalini, 60–100 μ longi, regulariter septati, in fragmenta cylindrica, bacilliformia, ut conidia unicellula, 7–9 μ longa, 2 μ crassa, separantes.

Specimen typicum in caulibus vetustis *Lupini candicantis* Rydb., prope Teton Pass, Jackson, Wyoming, 11 Jul., 1940, legit L. E. Wehmeyer, sub numero *1101c*.

Pycnidia arising beneath the epidermis, but soon erumpent and then entirely superficial, 250–600 μ in diameter, subglobose or somewhat depressed at first, wall thin, composed of a thin outer layer (10–15 μ) of dark walled pseudoparenchyma and a thicker inner layer (20–30 μ) of thin-walled hyaline parenchyma, soon collapsing in a pezizoid or irregular fashion, leaving a central ostiole-like papilla or ridge. Surface wall slightly radiate in cell arrangement, ostiolar opening slit-like with a radiate splitting of the wall. Conidiophores consisting of numerous, parallel, filiform, hyaline hyphae, 60–100 μ long, from the inner cell walls, and becoming regularly septate into cylindric, bacilliform segments, which fall apart as the one-celled, hyaline conidia which are 7–9 × 2 μ.

Togwotee Pass: On *Lupinus candicans* Rydb., July 8 (*1101c*) (Type).

S. of Teton Pass: July 11, on *Hedysarum uintahense* A. Nels. (*1126a*) and *Aquilegia coerulea* James (*1114e*).

The pycnidia of this species were, in some cases, found associated with those of *Heteropatella umbilicata* and have a structure very similar to those of the *Heteropatella*, but have entirely different spores. The radiate character of the upper wall is not so

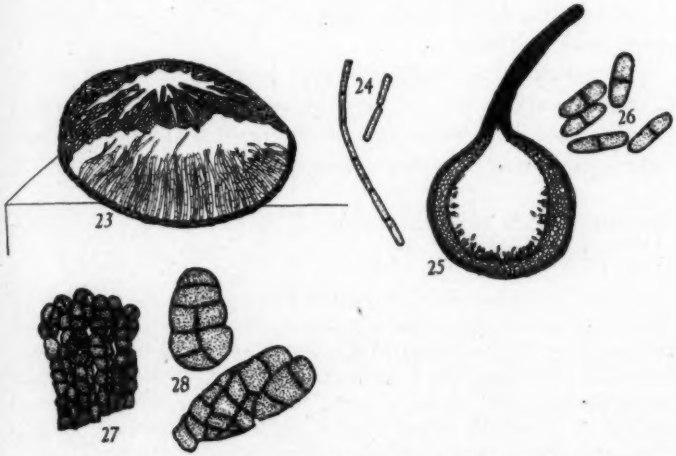


FIG. 23. Pycnidium of *Sirexcipula wyomingensis* sp. nov. to show radiate cell arrangement and ostiolar split of the upper wall and filiform, fragmenting conidiophores.

FIG. 24. Conidiophore of *Sirexcipula wyomingensis* sp. nov., to illustrate their fragmentation into conidia.

FIG. 25. Vertical section of pycnidium of *Pellionella tetonensis* sp. nov.

FIG. 26. Conidia of *Pellionella tetonensis* sp. nov.

FIG. 27. Portion of surface of stroma of *Steganosporium tuberculiforme* (E. & E.) comb. nov. showing manner of conidial formation.

FIG. 28. Conidia of *Steganosporium tuberculiforme* (E. & E.) comb. nov.

apparent, but the elongate ostiolar opening and the radiate splitting of the wall about it are characteristic of the Discellaceae. Even though the pycnidium does collapse in a pezizoid or wrinkled manner, it is definitely flattened-globose at first and might be placed in the Sphaerioidaceae on this basis. Of the genera with similar formation of the spores by septation of a filament, *Sirococcus* is given by Höhnel (**9**, 16, p. 119) as belonging in the

Leptostromataceae and *Sirophoma* is described as being immersed in bark, with a flattened ostiole. *Desmopatella* Höhn. (**10**, p. 76), which is considered a conidial stage of *Heteropeziza*, has a flatter pycnidium and branched conidiophores. *Peckia*, as interpreted by Höhnel (**9**, 16, p. 127) in *P. montana*, is without an ostiole and very similar. *Sirexcipula*, which according to Bubak (**1**, p. 295) differs only in the one-celled spores from *Siropatella* (which, in turn, is described with similar elongate to radiately split ostioles), seems to fit even better.

The collection on *Aquilegia* exuded its immature conidiophores in their entirety, in which condition this species is easily mistaken for a *Septoria*. As in the case of *Heteropatella umbilicata*, these collections were all taken from elevations of 9000 feet or more.

Steganosporium tuberculiforme (E. & E.) comb. nov. (FIGS. 27–28)

On surface as scattered, circular to elliptic, olive-black, granular, plane to concave discs, 250–500 μ in diameter, erumpent through the periderm and surrounded by a shallow collar of this tissue. Stromata consisting of a basal mass of coarse, thick-walled, black pseudoparenchyma, arranged more or less in parallel rows, and cutting off from the apical hyphae, all over the surface, conidia consisting of irregular, muriform, brown masses of cells, 17–32 × 9–10.5 μ, or sometimes larger. These masses of cells appear to arise by the division of component groups of cells in the apical portion of the conidiophore hyphae. The individual cells are 4–5 μ in diameter.

S. of Teton Pass: July 11, on *Sambucus microbotrys* Rydb. (*1133*).

It is difficult to say in what genus this fungus should be placed. It would run to *Endobotryella* in the Melanconiaceae, but that genus and *Endobotryon*, according to Höhnel (**9**, 9, p. 1534), are like *Thyrsidium*, with hyaline basal conidiophores. *Thyrostroma*, *Bonordoniella* and *Clathrococcum*, in the Tuberculariaceae, are also possibilities as is *Steganosporium*, in the Melanconiaceae.

Sporodesmium, under which generic name this species and *S. subcupulatum* were described by Ellis (**4**, p. 384), is in the Hyphomycetes, but Ellis describes both these species as "tuberculate" and

with muriform spores, subglobose to clavate-oblong in *S. subcupulatum* and sub-cuboid to subglobose in *S. tuberculiforme*. My material covers the spore range of both of these species, which are probably synonymous. It is difficult to interpret the irregular spores, but they are muriform at maturity, and since the fungus does not fit in *Endobotryella*, it is placed in *Steganosporium*. Since the second species described, *Sporodesmium tuberculiforme*, seems to fit my collection better, its specific name is used.

LITERATURE CITED

1. **Bubak, F. & Kabat, J. E.** Mykologische Beiträge. IV. Hedw. **46**: 288–298. 1907.
2. **Dearness, J.** Report of the Canadian Arctic Expedition 1913–1918. Vol. **4**, Botany, Part C, Fungi: 3–24. Ottawa. 1923.
3. **Ellis, J. B. & Everhart, B. M.** New fungi. Journ. Myc. **1**: 148–154. 1885.
4. ——. New species of fungi from various localities. Proc. Acad. Nat. Sci. Phila. **1894**: 322–386.
5. **Ellis, J. B.** New species of North American fungi from various localities. Bull. Torr. Bot. Cl. **24**: 277–292. 1897.
6. ——. New species of fungi from various localities. Amer. Nat. **31**: 339–343, 426–430. 1897.
7. ——. New species of fungi from various localities with notes on some published species. Bull. Torr. Bot. Cl. **27**: 49–64. 1900.
8. **Grove, W. B.** British stem and leaf fungi. Univ. Press. Cambridge. Vol. **1**: 1–488. 1935. Vol. **2**: 1–406. 1937.
9. **Höhnel, F. von.** Fragmente zur Mykologie. VIII. Mitt. Nr. 354–406. Sitz. Akad. Wiss. Wien, math.-naturw. Kl. **118**: 1157–1246. 1909. IX. Mitt. Nr. 407–467. Ibid. **118**: 1461–1552. 1909. XVI. Mitt. Nr. 813–875. Ibid. **123**: 49–155. 1914.
10. ——. Neue Fungi Imperfecti. 2. Mitt.—Mitt. bot. Lab. Techn. Hochs. Wien. **1**: 71–77. 1924.
11. **Karsten, P. A.** Fragmenta mycologica. XI–XIII. Hedw. **23**: 37–41. 1884.
12. **Lagerberg, T.** Om grabarrsjukan hos tallen, dess orsak och verkningar. Skogs. Tidsk. Fack. **8**: 221*–242*, 357*–382*. 1910.
13. **Lind, J.** Systematic list of fungi (micromycetes) from north-east Greenland. Danmark-Ekxped. t. Grønl. Nordøstkyst, 1906–08. Bind **3** (6): 149–162. 1910.
14. ——. Micromycetes from north-western Greenland found on plants collected during the Jubilee Expedition, 1920–23. Meddel. om Groenl. **71**: 161–179. 1926.
15. **Rostrup, E.** Mykologiske Notitser fra en Rejse i Sverigi i Sommeren 1882. Öfversigt K. Vetensk. Akad. Forhandl. **40** (4): 35–47. 1883.
16. **Seaver, F. J.** Phyllostictales. North Amer. Fl. **6**: 1–84. 1922.

17. **Solheim, W. G.** Mycoflora Saximontanensis Exsiccata. Univ. Wyo. Publ. Sci., Botany. Cent. I. **1**: 219–232. 1934. Cent. II. **3**: 89–99. 1937. Cent. III. **7**: 29–42. 1940. Cent. IV. **10**: 33–46. 1943.

18. **Spegazzini, C.** Mycetes Argentinenses. Ser. V. Anal. Mus. Nac. Buenos Aires. Ser. 3, **13**: 329–467. 1911.

19. **Sprague, R. & Cooke, W. B.** Some fungi imperfecti from the Pacific Northwest. Mycologia **31**: 43–52. 1939.

20. **Sydow, H. & P.** Mykologisches Mitteilungen. Ann. Myc. **17**: 33–47. 1919.

21. **Tehon, L. R.** Notes on the parasitic fungi of Illinois. Mycologia **25**: 237–257. 1933.

22. **Wehmeyer, L. E.** Studies on some fungi from Northwestern Wyoming. I. Pyrenomycetes. Mycologia **38**: 144–170. 1946.

EXPLANATION OF FIGURES

(All spores are drawn to a scale of approximately 1 mm. equals 1 μ)

FIG. 1. Conidia of *Apiocarpella Hedysari* sp. nov.

FIG. 2. Conidia of *Apiocarpella macrospora* (Speg.) Syd.

FIG. 3. Conidia of *Diplodina attenuata* sp. nov.

FIG. 4. Vertical section of pycnidium of *Hendersonia pinicola* sp. nov. on pine needle.

FIG. 5. Conidia of *Hendersonia pinicola* sp. nov.

FIG. 6. Conidia of *Leptostroma Lupini* sp. nov.

FIG. 7. Conidia of *Phoma bacilliformis* sp. nov.

FIG. 8. Conidia of *Phoma pulchellicola* sp. nov.

FIG. 9. Conidia of *Phoma jejuna* sp. nov.

FIG. 10. Conidia of *Phoma minuta* sp. nov.

FIG. 11. Conidia of *Phoma herbicola* sp. nov.

FIG. 12. Conidia of *Phoma herbarum* West.

FIG. 13. Conidia of *Phoma fusispora* sp. nov.

FIG. 14. Conidia of *Phoma Pedicularis* sp. nov.

FIG. 15. Conidia of *Phaeoseptoria Scirpi* sp. nov.

FIG. 16. Conidia of *Phoma linearispora* sp. nov.

FIG. 17. Conidia of *Phoma wyomingensis* sp. nov.

FIG. 18. Conidia of *Macrophoma Mimuli* sp. nov.

FIG. 19. Conidia of *Phoma selenophomoides* sp. nov.

FIG. 20. Conidia of *Selenophoma Donacis* var. *stomaticola* (Baüml.) Sprague and Johnson.

FIG. 21. Conidia of *Selenophoma maculicola* sp. nov.

FIG. 22. Vertical section through pycnidial cavities of *Selenophoma maculicola* sp. nov.

A PREVIOUSLY UNDESCRIBED FUNGUS CAUSING A LEAF SPOT OF BAMBOO

LELAND SHANOR [1]

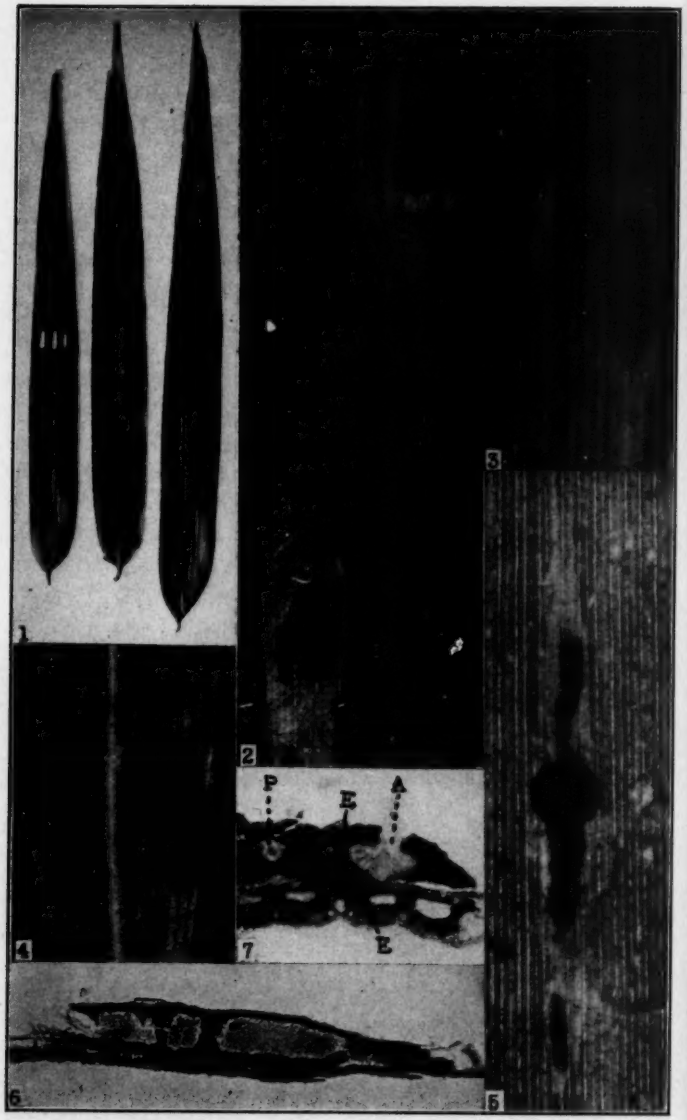
(WITH 8 FIGURES)

Although a considerable number of fungi have been reported as parasites of the leaves of bamboo, one occurring on specimens received by Mr. J. A. Stevenson of the Division of Mycology and Plant Disease Survey, Bureau of Plant Industry, Soils, and Agricultural Engineering, from El Salvador, which causes a leaf spot of *Arthrostylidium racemiflorum* Steud., appears to be undescribed. This sample of infected leaves was sent by the Bureau of Entomology and Plant Quarantine with a request for a determination of the fungus causing the leaf spot. Additional leaves infected with the same fungus were found later when specimens of the same host which were on deposit in the United States National Herbarium, Washington, D. C., were examined.

Through the courtesy of Dr. H. L. Mason, Curator of the Herbarium, University of California, the entire El Salvador collection, Tucker no. *750*, from which the original samples were taken was placed at my disposal for study. On the first leaves examined only a pycnidial fungus was found associated with the leaf spot disease but, when additional material was made available, ascomata were observed developing along with them. This material had been steam sterilized before it was received so that no opportunity to establish the relationship of the two phases by a comparison of cultures derived from conidia and from ascospores was afforded, as would be desirable, provided, of course, that this fungus could be grown on artificial media.

[1] Formerly Pathologist, Emergency Plant Disease Prevention Project, Bureau of Plant Industry, Soils, and Agricultural Engineering, United States Department of Agriculture, Beltsville, Maryland.

The author wishes to express his sincere appreciation to Mr. J. A. Stevenson for placing the original samples at his disposal; to Dr. W. W. Diehl for helpful suggestions; to Miss Edith K. Cash for the preparation of the Latin diagnoses; and to Mrs. Agnes Chase for the determination of the host.



FIGS. 1–7. Leaf spot of Bamboo.

THE CHARACTERISTICS OF INFECTED AREAS

The spots caused by this organism are oval, linear, or fusiform in shape and quite small, seldom reaching a length greater than 5 mm. or a width greater than 2 mm. The tissue of the invaded areas becomes necrotic and, evidently soon after infection has occurred, diseased tissue turns a yellowish brown color. When the black stroma of the fungus has developed in them, the parasitized areas stand out quite strikingly in the green leaf tissue (FIGS. 1, 2, 3). Spots lack a definite margin but laterally are usually somewhat limited by the veins of the leaf and there is no evidence of a border of a different color surrounding them. The individual spots caused by a single infection are usually widely scattered on the leaflets but are sometimes sufficiently close together for their necrotic areas to coalesce (FIG. 2). The pycnidial stage of the fungus apparently precedes the ascocarpic stage and commonly is the only phase encountered on infected leaflets. In the material which I have examined, ascocarpic fructifications have never been seen to develop independently.

THE PYCNIDIAL PHASE

Pycnidial stromata (FIGS. 2, 3, 6) develop within the leaf tissue, usually nearer one or the other of the epidermal layers, in all probability nearer that one through which infection occurred. The outer wall of each stroma is thicker than the inner one and as it

---

EXPLANATION OF FIGURES 1–7

FIG. 1. Leaves of *Arthrostylidium racemiflorum* Steud. showing numerous infected areas caused by the leaf-spot fungus. Pycnidial and ascocarpic phases are both present on the central leaf; only pycnidial phase on the other two. Approx. × 1.

FIGS. 2 and 3. Higher magnification of spots with pycnidial stromata. Approx. × 10.

FIGS. 4 and 5. Higher magnification of spots with both pycnidial stromata and ascocarps. Figure 4 of dry material; figure 5 after soaking 1 hour in distilled water. Approx. × 10.

FIG. 6. Median longitudinal section through a pycnidial stroma showing locules filled with conidia. Approx. × 72.

FIG. 7. Cross section through pycnidial stroma (P) and ascocarp (A) showing attachment of the ascocarp through ruptured epidermis of leaf (E). Approx. × 100. (Figures 1–5 by Robt. Taylor; figures 6 and 7 by the author.)

develops the epidermal cells become somewhat confluent with it. Stromata are elongate and contain one to four locules separated by parenchymatous walls (FIG. 6). The outer walls of the stromata are made up of compact angular or somewhat rounded cells with thickened walls which are carbonaceous and brittle. The inner wall is not so thick and the cells are not so carbonaceous as those of the outer wall.

Conidia develop on conidiophores which line the cavities of the stroma. Conidiophores (FIG. 8) are cylindrical and each appears

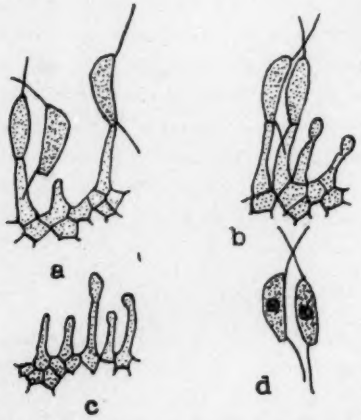


FIG. 8. Camera lucida drawings of mature and immature conidia, conidiophores and associated cells (a–c, from unstained material; d, from material stained with phloxine). × 650.

to give rise to a single conidium. Conidia are produced in great abundance and are deposited within the cavity of the locules (FIG. 6). A gelatinous matrix appears to be formed within the cavities along with the spores, for conidia have a strong tendency to remain together when spores emerge from pycnidia naturally or when stromata are crushed in water. When mature stromata are moistened, the expansion of the locule contents causes an irregular longitudinal rupturing of the wall, thus making it possible for the spores to escape. Conidia are hyaline, single-celled, and have two straight or slightly curved setae which are attached slightly to one side, one near each end of the spore (FIG. 8). They are slightly

clavate to navicular in shape and measure up to 16.5 × 5.5 μ, and setae measure usually about 12 μ in length.

This pycnidial stage possesses generic characteristics similar to those ascribed to *Ciliochorella* Sydow and Mitter (**1935**) and since the pycnidial stage has been encountered frequently without an associated ascocarpic stage, it is here included in this genus, being designated as a new species. Its key characters also lead to the genus *Diachorella* Hoehnel (**1923**) which was included in the phyllachoroid Pachystromaceae in his *System der Fungi Imperfecti* Fuckel. *Diachorella,* however, was not provided with a type species, so according to the International Rules of Botanical Nomenclature cannot be recognized as valid. Clements and Shear (**1931**) noted that *Diachorella* Hoehnel was not provided with a type species and Sydow and Mitter (**1935**) also pointed this out. Ainsworth and Bisby (**1941**) recorded *Diachorella* as a nomen nudum.

Ciliochorella bambusarum sp. nov.

Stromata in maculis insidentia, nigra, plerumque singula sed interdum aggregata, ovalia vel linearia, subconvexa, carbonacea, innata, usque 2.5 mm. longa et 0.5 mm. lata, plurimum 1 × 0.25 mm., in centro usque 0.25 mm. crassa, pariete exteriori carbonaceo et prosenchymatico, e cellulis angularibus vel subrotundis composito, pariete interiori tenuiori et minus carbonaceo; loculi 1–4, conidiophoris vestiti, in maturitate rima irregulari longitudinali dehiscentes; conidiophora cylindrica usque anguste clavata, 10–26 μ longa, 2–2.5 μ lata; conidia abundantia, anguste clavata vel navicularia, hyalina, unicellularia, truncata, 14–16.5 μ longa, 4.75–5.2 μ lata, utrinque sub apice setula prominenti recta vel subcurvata 9–15 μ longa praedita.

On *Arthrostylidium racemiflorum* Steud., John Tucker no. *750,* collected January 8. 1942, growing on steep west facing canyon slope in coffee plantation, south side of Mt. Cocoquatique, El Salvador, at an elevation of about 4500 ft. The type (Tucker no. *715A*) has been placed in the Mycological Collections of the Bureau of Plant Industry. Isotypes are being deposited with the Herbarium of the University of California, Berkeley, with the Farlow Herbarium of Harvard University and with the Herbarium of the University of Illinois.

This fungus has also been observed on scattered leaves of the following collections of *A. racemiflorum* Steud. in the United States National Herbarium:

(1) Mexico, Jan. 5–Feb. 6, 1892. Edward Palmer 1914 (U. S. Nat. Herb. no. *1, 021, 482*).

(2) Telaran, Province of Guanacaste, Costa Rica, Paul C. Standley and Juvenal Valerio 45, 665 (U. S. Nat. Herb. no. *1,307, 183*).

(3) Ahuachapan, Department of Ahuachapan, El Salvador, Jan. 8–27, 1922. Paul C. Standley 19, 995 (U. S. Nat. Herb. no. *1, 135, 822*).

(4) Panama Canal Zone, July 1923. H. Johansen 17 (U. S. Nat. Herb. no. *1, 167, 472*).

THE ASCOCARPIC PHASE

Ascomata of this leaf-spot fungus appear to develop only from the stroma of the imperfect stage, for, when the perfect stage is present, it has always been found associated with pycnidial stromata.

Ascomata develop to the side of pycnidia, usually near either one or both ends of the stroma, forming a superficial laterally-attached fructification (FIGS. 4, 5, 7). These fruiting bodies are usually less than 1 mm. in length, are fusiform to somewhat allantoid in shape, and are jet black in color. The roof of the ascocarp is arched, made up of heavily carbonized cells, and opens by an irregular median longitudinal slit. The basal plate is made up of pseudoparenchymatous cells which are carbonized but not as heavily as the roof tissue. The radiate development of ascomata is clearly evident in young ascocarps and along the margins of more mature fruiting bodies.

Asci arise from a flattened basal layer, are narrowly clavate with short stalks and measure 55–69 μ long by 10–12 μ wide. Ascospores are eight in number, ovoid, and pointed at one end, hyaline, one-celled, measuring 13.8–14.5 μ in length by 4.5 μ at widest point.

Features of the fungus clearly indicate that it belongs in the Hemisphaeriales in the system of classification as understood by Theissen and Sydow (**1917**). It might be considered as a somewhat aberrant member of the family Polystomellaceae since the lateral attachment could be regarded as equivalent to a central column. Gäumann and Dodge (**1928**) in discussing the char-

acteristics of this family call specific attention to the central column or columns by which the ascomata of fungi belonging to this group are attached to the host tissue. The lateral attachment of the ascomata to a pycnidial stroma, which in this case might be compared to the hypostroma of other genera, is a fundamental and outstanding feature which clearly characterizes a distinct genus. A genus having this distinguishing feature apparently has not been described, so it becomes necessary to establish a new genus for the bamboo leaf-spot fungus.

Lateropeltis gen. nov.

Ascomata parva, nigra, lateraliter affixa, marginibus radiata, e fusiformibus allantoidea, rima irregulari mediana longitudinali aperta; asci anguste clavati, breve pedicellati; ascosporae hyalinae, unicellulares; paraphyses praesentes.

Lateropeltis bambusarum sp. nov.

Ascomata superficialia, ad stromata pycnidica lateraliter affixa, nigra, usque 1 mm. longa e fusiformibus allantoidea; tecto arcuato e cellulis dense carbonaceis composito, rima irregulari mediana longitudinali aperto, strato basali pseudoparenchymatico; asci e strato basali applanato orti, anguste clavati, breve pedicellati, 55–69 × 10–12 μ; ascosporae 8, ovoideae, apice uno acutae, hyalinae, unicellulares, 13.8–14.5 × 4.5 μ; paraphyses simplices (?).

On *Arthrostylidium racemiflorum* Steud., associated with pycnidial phase, John Tucker no. *750*, collected January 8, 1942, growing on steep west facing canyon slope in coffee plantation, south side of Mt. Cocoquatique, El Salvador, at an elevation of about 4500 ft. The type (Tucker no. *751B*) has been placed in the Mycological Collections of the Bureau of Plant Industry. Isotypes are being deposited with the Herbarium of the University of California, Berkeley, with the Farlow Herbarium of Harvard University, and with the Herbarium of the University of Illinois.

Additional ascomata have been found on scattered leaves of a collection of *A. racemiflorum* Steud., Panama Canal Zone, July 1923. *H. Johansen 17* (U. S. Nat. Herb. no. *1, 167, 472*).

SUMMARY

A fungus causing a leaf spot of a bamboo, *Arthrostylidium racemiflorum* Steud., is described. The pycnidial stage occurred

abundantly on the material studied and has been designated as *Ciliochorella bambusarum* sp. nov. The ascocarpic stage is a hemisphaeriaceous fungus, placed in a new genus, *Lateropeltis*, a genus distinguished by having ascomata laterally attached to the stroma of the pycnidial stage. The ascogenous stage of this fungus is not known to occur except in conjunction with the pycnidial phase.

URBANA, ILLINOIS

LITERATURE CITED

Ainsworth, G. C. & G. R. Bisby. A dictionary of the fungi. Imperial Mycological Institute, Kew. 1943.

Clements, F. E. & C. L. Shear. The genera of fungi. iv + 496 pp., 58 pls. H. W. Wilson Co., New York. 1931.

Gäumann, E. A. & C. W. Dodge. Comparative morphology of fungi. xiv + 701 pp. McGraw-Hill Book Co., Inc., New York and London. 1928.

Hoehnel, F. von. System der Fungi Imperfecti Fuckel. In R. Falck, Mykol. Untersuch. u. Ber. Bd. 1, Heft 3, n. 9, pp. 301–369. 1923.

Sydow, H. & Julian Mitter. Fungi indici. II. Ann. Mycol. **33**: 46–71. 1935.

Theissen, F. & H. Sydow. Synoptische Tafeln. Hemisphaeriales, Myriangiales, Perisporiales, Trichothyriaceae. Ann. Mycol. **15**: 389–491. 1917.

STUDIES ON SOME CALIFORNIA FUNGI. III

LEE BONAR

Studies on material from my own collections as well as those sent in by others have afforded numerous records of the extension of the known range of distribution, new host records and so forth. Some of these along with the description of certain new species are considered worthy of publication.

PHYSODERMA HYDROCOTYLIDIS Viegas and Teixeira, Bragantia **3**: 8, 226–228. 1943.

A small collection of this species on *Hydrocotyle ranunculoides* L. was made at Berkeley, California, November 1930. Preliminary examination suggested that this might be *Entyloma hydrocotylis* Speg. A portion of the material was sent to Dr. G. P. Clinton for identification. He replied that it was not a smut but a chytrid. Further studies were not made at that time, and repeated search for more material failed until September 1943, when it appeared in abundance in the same pools at Berkeley. A more critical study was undertaken and the material proved to be similar to a collection in the University of California Herbarium from Golden Gate Park, San Francisco, June 1930, W. W. Diehl. Correspondence with Dr. Diehl revealed that he had compiled records of various collections for the United States and attention was also called to the description cited above on *Hydrocotyle reniformis* Spreng. from Brazil. Our material proves to be the same species and checks with specimens from Brazil, supplied by Dr. Viegas. Dr. Diehl has kindly permitted me to include the records of the distribution of the species compiled by himself and Dr. E. F. Guba.

On *Hydrocotyle ranunculoides* L. Black Pond, Fairfax Co., Va., June–October 1923 (5 coll.) Diehl, November 21, 1923, Guba and Diehl; Golden Gate Park, San Francisco, California, June 8, 26, 1930, Diehl; Berkeley, California, October 1930, H. E. Parks, No-

vember 21, 1930 and September 21, 1943, Lee Bonar; Mobile, Alabama, May 22, 1889, Charles Mohr 464, *ex* U. S. Natl. Herb. *770075;* York Furnace (Pa.?), August 20, 1895, *ex* Herb. Jos. Crawford (in Herb. Phila. Acad.); St. Georges, Del., July 22, 1875, A. Commons (in Herb. Phila. Acad.).

Dr. E. F. Guba reported presence of the fungus on specimens in the phanerogamic herbarium of Cornell University as follows:

On *Hydrocotyle* sp., Cape May, N. J., Aug. 30, 1897, A. Gershoy.

On *H. ranunculoides,* Appalachicola, Fla., 1893, A. W. Chapman.

On *H. umbellata* L., Riverside, Calif., Dec. 17, 1918, M. F. Barrus.

The correct identity of *Entyloma hydrocotylis* Speg. remains in question. Dr. A. P. Viegas informs me (personal communication) that he has examined the type specimen and finds that it is not a species of *Entyloma,* but has been unable to settle the point as to its correct disposition.

Physoderma hydrocotylidis V. & T. is near to *Physoderma vagans* Schroet. but distinguished by the sporangia being smaller with colorless walls, whereas those of *P. vagans* develop a distinct brown color. The sporangia of *P. vagans* were described as "verrucis" but critical examination of material from Bamberg, Bavaria, reveals only smooth-walled sporangia.

COLEROA CHAETOMIUM (Kze.) Rabh. var. AMERICANA Petrak, Ann. Mycol. **20**: 181. 1922.

On living leaves of *Rubus leucodermis* Dougl., Lemonade Springs, South Fork Mountain, Trinity Co., Calif., August 28, 1941, H. E. Parks and J. P. Tracy, No. *11514.*

This variety was described from material collected in Pend Oreille Co., Washington, and its presence in northern California on the same host extends its known range. The rather severe infection on these native plants suggests that it may be a potential danger to the nearly related cultivated raspberries. The variety is distinguished by its glabrous perithecia from the European species *C. Chaetomium,* which is a common parasite on cultivated raspberries.

GUIGNARDIA CAMELLIAE (Cke.) Butler

On living leaves of *Thea sinensis* L. (*Camellia sinensis* Kunze) in Strybing Arboretum, Golden Gate Park, San Francisco, California, June 9, 1944, Lee Bonar. The host plants were grown from seed and no other tea plants are known from the vicinity. The appearance of the fungus in this area under these conditions is surprising.

HYALOPSORA CHEILANTHIS (Pk.) Arth.

On *Adiantum emarginatum* Hook., near mouth of South Fork of Trinity River, Trinity Co., Calif., March 1927, March 1941, J. P. Tracy, Nos. *7856* and *16842*. These collections establish a new host for this rust and there were only scant infections on the leaves. Both were found in association with more abundant infections of the rust on its common host, *Gymnogramma triangularis* Kaulf.

PUCCINIA OXALIDIS (Lév.) Diet. & Ellis

This species has been reported in the United States from Louisiana, Texas and New Mexico. The uredial stage was collected at Berkeley, California, October 19, 1942, Lee Bonar, on *Oxalis rubra* St. Hil., which is an escape on the University of California campus. A second collection was made at Hamilton City, Glenn Co., California, May 8, 1944, E. B. Copeland, on *Oxalis Bowieana* Lodd., which was in cultivation in a garden. Examinations of the Berkeley area through three following seasons have failed to show any recurrence of the infection or spread to near-by plants of native species of *Oxalis*.

FISTULINA HEPATICA (Huds.) Fr.

This well known species is apparently rare in the Pacific Coast states, but available records show collections from Bald Mountain, near Korbel, Humboldt Co., Calif., R. J. Kelley, October 25, 1918, on *Lithocarpus densiflora* (H. & A.) Rehd. (an immature specimen) and from Inverness, Marin Co., California, B. Schreiber, November 1936, Lee Bonar, November 1937, on *Castanopsis chrysophylla* D. C. Later observations have shown the sporophores appearing on the same tree in successive years at the Marin Co. site.

ARTICULARIELLA AURANTIACA (Ell. & Mart.) Höhn., Sitz. K. Akad. Wiss. Wien **118**: 410–411. 1909.

Ascomycetella aurantiaca Ell. & Mart. Jour. Mycol. **1**: 97. 1885.

Leptophyma aurantiacum (E. & M.) Sacc. Syll. Fung. **8**: 845. 1889.

Ellis and Martin described both the ascus and conidial stages of this species from the leaves of *Quercus laurifolia* Michx., from Florida, giving no name to the conidial stage which was distinct from any established form genus in the Fungi Imperfecti. Von Höhnel erected the form genus *Articulariella* to characterize the conidial form, making his studies from the original collection.

Collections of this species were made by J. M. Linsdale, Hastings Reservation, Monterey Co., California, Oct. 18 and Nov. 10, 1942, on the leaves of *Quercus lobata* Née. These collections show only the conidial stage. This extends the known distribution and host range of the species.

Ascochyta salicis sp. nov.

Maculis dispersis, 2–10 mm. diam., angularis, a venis atris limitatis, badii, infra cinereis; pycnidiis hypophyllis, coarctatis, globosis, 80–145 μ diam., muris membranaceis, atris, ostiolo poroso; conidiis fusiformis, rectis aut aliquantulis curvatis, uniseptatis (raro biseptatis), vix constrictis ad septis, hyalinis, 28–40 × 4–7 μ, saepe in cirrhis albidis; conidiophoris indistinctis.

Spots scattered, 2–10 mm. diameter, angular, limited by darkened veins, bay brown, cinereous below; pycnidia hypophyllous, crowded, subepidermal, erumpent, globoid, 80–145 μ diameter; wall membranaceous, carbonaceous; ostiole poroid; conidia fusiform, straight or slightly curved, uniseptate (very rarely biseptate), barely constricted at septum, hyaline, 28–40 × 4–7 μ, frequently in white cirrhi; conidiophores very short and indistinct, up to 5 μ long.

On living leaves of *Salix laevigata* Bebb, Hastings Reservation, Monterey Co., California, April to June 1941, 5 colls., J. M. Linsdale (type), June 12, 1941, Univ. Calif. Herb. No. *697789*.

This species is assigned to the genus *Ascochyta* since the mature conidia in the extruded cirrhi are normally uniseptate even though a fraction of one per cent of them may develop a second septum.

Cercospora ligusticicola sp. nov.

Maculis elongatis ellipticis, usque 5 mm. longitudinis, saepe confluentibus, fulvidis; conidiophoris hypophyllis, raris amphigenis, delicatulis, albidulis, erumpentibus ex stromatis minutis, 1–15 in fascia, 25–50 × 3–4 μ, subhyalinis vel fuscis; conidiis cylindraceis, ad apices acuta, usque quadriseptatis, subhyalinis, 40–65 × 3–4 μ.

Spots elongate elliptic, up to 5 mm. long, becoming confluent, fulvescent; conidiophores hypophyllous, rarely amphigenous, delicate, albescent, emerging from small stromata, 1–15 in a fascicle, 25–50 × 3–4 μ, subhyaline to fuscous; conidia cylindric, acute at the tips, up to 4-septate, subhyaline, 40–65 × 3–4 μ.

On living leaves of *Ligusticum Grayii* C. & R., Bear Creek, Plumas Co., Calif., July 30, 1942, Lee Bonar (type), Univ. Calif. Herb. No. *697787*. Portion in Cornell University Herbarium.

I am indebted to Dr. Charles Chupp for aid in the study of this species.

PLEUROTHYRIUM LONGISSIMUM (Lib.) Bubak, Ber. d. Deuts. Bot. Ges. **34**: 321–322. 1916.

On dead leaf stalks of *Athyrium filix-foemina* (L.) Roth var. *californica* Butters, Butte Meadows, Butte Co., Calif., June 1943, E. B. Copeland.

This species was originally described as *Leptostroma longissimum* Lib., Plantae Cryptogamae Arduennae Fasc. **III**. 1834. Bubak later studied the original material and renamed it. I find no other records of collections. Our material agrees well with the description given by Bubak, except that the spores are found to be 70–110 × 1.5–2 μ, and to have up to fifteen septa. Bubak noted that the original material was somewhat immature whereas the recent collection has abundant mature spores.

RAMULARIA LOPANTHI Ell. & Ev., Bull. Torr. Bot. Cl. **24**: 472. 1897.

This species was described from a collection by J. J. Davis, No. *9511*, from Yosemite, California, June 1895. It was listed as on the leaves of *Lopanthus scrophulariaefolius* Willd., which has been changed to *Agastache scrophulariaefolius* (Willd.) O. Kuntze. This species is not known to occur in the Pacific Coast states, so

that the host determination for the original collection was evidently incorrect.

Typical material of this fungus was collected along Bear Creek, Plumas Co., California, July 1942, Lee Bonar, on *Agastache urticifolia* (Benth.) O. Kuntze and the original collection was probably on this same common Sierran species.

Ramularia Phaceliae sp. nov.

Maculis irregularis, saepe confluentibus, partem magnam foliorum occupantibus, fulvescentis, infra cinereis; conidiophoris solitaris, raro caespitosis, numerosis, simplicibus, directis aut raro geniculatis, paucis septatis, 20–40 × 3–4 μ; conidiis solitariis vel catenulatis, cylindraceo-ellipsoideis, hyalinis, 1–3-septatis, cicatricibus terminalibus manifestis, 30–40 × 5–7 μ.

Spots irregular, becoming confluent and occupying most of the leaf, fulvescent, cinereous below; conidiophores single to rarely cespitose, abundant, simple, straight or rarely geniculate, sparingly septate, 20–40 × 3–4 μ; conidia solitary to catenulate, cylindric-ellipsoid, hyaline, 1–3-septate, terminal scars evident, 30–40 × 5–7 μ.

On living leaves of *Phacelia procera* Gray, Gold Lake, Plumas Co., Calif., July 31, 1942, Lee Bonar (type), Univ. Calif. Herb. No. *697788*.

This species is near to *Ramularia Hydrophylli* Ell. & Ev., but is distinguished by being strictly hypophyllous, having conidiophores predominantly simple and straight, and by the longer non-clavate conidia.

RAMULARIA SIDALCEAE Ell. & Ev., Jour. Mycol. **4**: 1. 1888.

Collected on living leaves of *Sidalcea asprella* Greene, along Bear Creek, Plumas Co., California, July 1942, Lee Bonar. This represents a new host and extension of the range recorded for the species.

Septogloeum Cercocarpi sp. nov.

Maculis dispersis, irregularis, saepe confluentibus, fulvis, infra cinereis-brunneis, margine definito; acervulis hypophyllis, subepidermalibus, erumpentibus, 150–225 μ diam., contextu basilari hyalino; conidiophoris 7–10 × 3 μ; massis sporidiorum cremeis, bullatis; conidiis clavati-cylindraceis, curvatis ad spiralis, hyalinis, 1–3-septatis, 27–38 × 6–8.5 μ.

Spots scattered, irregular, often confluent, fulvous, cinereous brown below, margin distinct; acervuli hypophyllous, subepidermal, erumpent, 150–225 μ diameter, basal layer hyaline; conidiophores 7–10 × 3μ; spore masses cremeous, bullate; conidia clavate-cylindric, curved to spirally bent, hyaline, 1–3-septate, 27–38 × 6–8.5 μ.

On living leaves of *Cercocarpus betuloides* Nutt., Hastings Reservation, Monterey Co., Calif., June 1, 1941 (type), Univ. Calif. Herb. No. *697790*, July 3, 1941, J. M. Linsdale; Piru, Ventura Co., Calif., April 17, 1934, A. D. Gifford; Santa Catalina Island, Calif., July 4, 1909, F. M. Reed.

SEPTOGLOEUM MACULANS Hark., Bull. Calif. Acad. Sci. **1**: 32. 1884.

This is a very local species as evidenced by the fact that recent collections on *Salix lasiolepis* Benth., July 1941 and June 1944, are from the exact locality of the original Harkness collection of 1882, yet this fungus has not been recorded from any other area. It is distinct from *Septogloeum salicinum* (Pk.) Sacc., in that the spots are larger and very dark brown, also in the spores which are frequently very strongly curved and have a distinctly greater width, up to 11 microns in diameter. The radiate fibrous character of the spots emphasized by Ellis, Jour. Mycol. **1**: 117, and by Dearness, Mycologia **9**: 361, is not a consistent character in the Harkness collection in the California Academy of Sciences Herbarium, nor in the recent collections. This is instead a wrinkling of the cuticle of the leaf around the margin of the spots as well as in other areas of the dried leaves and not apparent in the fresh material.

Septoria Fremontiae nom. nov.

Septoria angularis Hansen and Thomas, Madroño **8**: 42. 1945.

On leaves of *Fremontia mexicana* (Davidson) McBride.

Septoria angularis Dearn., and Barth., Mycologia **8**: 103, 1913, on *Solidago latifolia* L., has priority and necessitates the assignment of another name to the species on *Fremontia*, since it is quite distinct from that on *Solidago*.

UNIVERSITY OF CALIFORNIA,
BERKELEY, CALIF.

NOTES AND BRIEF ARTICLES

Aerosol OT in the Preparation of Microscopic Mounts of Fungi

In making mounts for the microscopic examination of various fungi with aerial sporulation, difficulty is often encountered in wetting the conidia and conidiophores in water. It has been customary to use 70 per cent alcohol as a wetting agent in the preparation of the mount but the alcohol treatment is not always satisfactory because of its dehydrating effect upon the protoplasm and the rapid evaporation of the alcohol at the surface, causing violent currents which disrupt the arrangement of the conidial head. It was suggested to me by Dr. Gerrard Macleod of the Upjohn Company that the wetting agent, Aerosol OT, might be useful as a substitute for alcohol. In the past year I have used successfully a 1 per cent aqueous solution of Aerosol OT in the preparation of hundreds of temporary mounts of the Aspergilli, Penicillia, Mucorales, Actinomycetes, and a miscellaneous group of Hyphomycetes. The Aerosol solution serves not only as a wetting agent but also as a mounting medium which is readily miscible with the lacto-phenol mixture commonly used in the preservation of the temporary mount. Since I have seen no report in the literature of the use of Aerosol OT as a wetting agent for microscopic mounts of the fungi, the publication of this note seemed to me to be advisable.

Aerosol OT is manufactured by the American Cyanamid and Chemical Corporation. It is advisable to purchase Aerosol OT–100%, a waxy solid which will dissolve slowly in distilled water.—Alma J. Whiffen.

Research Laboratories,
Upjohn Company,
Kalamazoo, Michigan

Isolation of Thielaviopsis basicola from Soil by Means of Carrot Disks

In attempting to isolate *Sclerotinia sclerotiorum* from soils and plant debris by means of living carrot slices, which are highly sus-

ceptible, very little *Sclerotinia* was isolated, but *Thielaviopsis basicola* (Berk. and Br.) Ferraris was isolated in abundance from a number of soils. This method of isolation appears superior to the methods previously published by Gilbert [1] and Levykh.[2]

Soils from field collections were spread over the surface of 5 mm. thick carrot root disks in petri dishes and enough water was added by atomizing to make the soil quite moist but with no free water present. After two to four days at room temperature the disks were washed to free them of soil and incubated in moist chambers. When soils containing *Thielaviopsis* were used as inoculum, grayish colonies appeared in about six days after inoculation. At first masses of endoconidia were formed, and later the colonies turned almost black as macroconidia were formed in abundance. Transfers direct from the aerial mycelium to potato dextrose agar gave pure cultures of *Thielaviopsis* in most cases. There was no apparent discoloration or decay of the carrot disks until about ten days after inoculation, and microscopic examination of stained free hand sections indicated that the mycelium had penetrated between and within the cells without disorganizing them until invasion was well advanced. Cultures on carrot disks, like cultures on agar, yielded a strong odor of amyl acetate. When dilute spore suspensions from pure cultures of *Thielaviopsis* from agar cultures were used as inoculum and the carrot slices were therefore not washed after inoculation, *Thielaviopsis* colonies could be counted in three days.

Of seventeen soil collections from twelve locations in the San Francisco Bay and Santa Clara Valley regions, *Thielaviopsis* was isolated in twelve collections at seven locations. The two most abundant sources were an ornamental garden in Berkeley, and an apricot orchard near Hollister. In one test from the flower bed, all of seventeen test disks showed *Thielaviopsis* and most of them showed several colonies. A collection from a carrot field where carrots had been raised frequently in previous years yielded

[1] Gilbert, W. W. An improved method of isolation of *Thielavia basicola*. Phytopath. **16**: 579. 1926.

[2] Levykh, P. M. (Translated title.) Methods of determining the degree of soil infestation with chlamydospores of *Thielaviopsis basicola* (Berk.) Ferraris. Abstract in Rev. Appl. Myc. **17**: 710–711. 1938.

Thielaviopsis on only one of eight test disks. Of two hundred and forty disks in all tests, *Thielaviopsis* was isolated on sixty-six. In none of the locations was *Thielaviopsis* observed as a pathogen of the crops grown there.—C. E. YARWOOD.

UNIVERSITY OF CALIFORNIA,
BERKELEY, CALIFORNIA

NOTE ON BAGNISIOPSIS

Recently the writer has received parts of type material of *Phyllachora mexicana* Sacc., *Bagnisiopsis orellana* Syd. and *B. puyana* Syd. from Dr. Th. Arwidsson of the Botanical Museum of Stockholm. At the time of writing the paper, "Bagnisiopsis species on the Melastomaceae" (Mycologia **35**: 312–334. 1943) it was impossible to obtain these from Europe.

Bagnisiopsis orellana Syd. on *Miconia crocea* Naud. No. 1182, Sydow, Fungi exotici exsiccati and No. 177, Sydow Fungi Aequatoriensis, both have small, black orbicular stromata with no spines and with spores 9–16 × 7–12 μ, and so this name becomes a synonym of *B. tijucensis* Theiss. & Syd.

The other two specimens, *Phyllachora mexicana* Sacc. on *Miconia* sp. collected by Bonansea, and No. 1183 *Bagnisiopsis puyana* Syd., Fungi exotici exsiccati, on *Miconia pujanae* Markgr., both have the macroscopic appearance of *B. tijucensis*, but are immature with no ascospores and so cannot be placed in a specific position.—JULIAN H. MILLER.

A NEW WESTERN POLYPORE

W. A. MURRILL

A fine new polypore was collected last fall in a coniferous forest in the state of Washington by Dr. A. S. Rhoads, who made complete notes on the fresh specimens.

Scutiger skamanius sp. nov.

Pileo subplano, 19 × 16 × 3 cm., griseo, dein fuligineo, subfibrilloso, atromaculoso; tubulis decurrentibus, sulphureis, 1–2 per mm., angulatis, dein fibriatis; sporis ellipsoideis, levibus, hyalinis, 7.5–8 × 6.5 μ; stipite solido, bulboso, atromaculoso, 15 × 5–5.5 cm.

Pileus subcircular, plane or slightly depressed, 19 × 16 cm., up to 3 cm. thick; surface grayish, becoming grayish-brown to fuliginous with age, slightly fibrillose, decorated with conspicuous darker spots; margin thin, concolorous, sharply inflexed; context fleshy-tough, pallid, homogeneous; tubes decurrent to the base of the stipe, short, pale-sulphur-yellow, deeper yellow on the stipe, mouths 1–2 per mm., angular, uneven or eroded on the rather thin edges; spores broadly ellipsoid, smooth, hyaline, 7.5–8 × 6.5 μ; stipe solid, rigid when dry, bulbous, tapering upward, reticulate, blotched with gray or dark-brown as though stained, 15 × 5–5.5 cm.

Type collected by A. S. Rhoads on the ground among conifers in the Wind River Experimental Forest, Skamania Co., Wash., about 1400 ft. elevation, Oct. 25, 1945 (*F 19288*). A small specimen was growing attached to the large one used as the basis for notes. For those using Saccardo the combination **Polyporus skamanius** is made.

WANTED

MYCOLOGIA, volume 32, no. 3; volume 33, nos. 2 and 3. Through wartime losses these numbers have been exhausted or reduced to the danger point. The Managing Editor will be glad to pay for any of the above parts available.—FRED J. SEAVER, THE NEW YORK BOTANICAL GARDEN.